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By
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Patterns of Mental Functioning Associated with Prejudice in Children^{1,2}

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IN HIS scholarly analysis of the determinants of prejudice, Allport (2) says: "Whatever our values may be, prejudice is a *fact of mental organization* and a *mode of mental functioning*." Among the psychological characteristics peculiar to prejudiced thinking he notes the following: fallacious overgeneralization, prejudgment, misjudgment, stereotyping, perseverative mental sets, categorical thinking, and a need for certainty (3). While some of these cognitional factors have been found to vary directly with a high degree of prejudice and/or ethnocentrism, neither the covariance of the two sets of variables nor the "prejudice syndrome" has been conclusively de-

lineated. This monograph examines the interrelationships of prejudiced and unprejudiced attitudes in seven-year-old children and their characteristic patterns of thought and problem solving. In so doing, we have deliberately ignored socio-cultural and other environmental factors which may bear on the development or functional utility of prejudice. For purposes of study, we have given central importance to the cognitive context out of which attitudes and behavior mature. The viewpoint adopted here is that both "structural" (i.e., cognitional) as well as "dynamic" (i.e., motivational and cultural) factors lie at the roots of many hostile attitudes. It is probable that cultural and motivational factors may profoundly influence the development of cognitional capacities and those in turn serve to channelize and direct the former factors (34).

¹ This monograph is based upon a dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Social Psychology in the Department of Social Relations, Harvard University, 1950.

² The author wishes to express his gratitude to Gordon W. Allport who guided the course of this study throughout. Appreciation is greatly felt to the school system of Brookline, Massachusetts, Ernest T. Caverley, Superintendent; James R. Hobson, Chief School Psychologist; Elgie Clucas, Principal of the Michael Driscoll School; and to the teachers and children of the second grade of that school during 1949-1950 for the splendid cooperation received during the investigation. For their generous assistance at different stages of this study, indebtedness is felt to Else Frenkel-Brunswik of the University of California, Robert A. Harris of Brooklyn College, Gardner Murphy of the Menninger Foundation, and Robert Sears of Stanford University. This study was carried out while the author was the recipient of a Sigmund Livingston Fellowship of the Anti-Defamation League of B'nai B'rith.

However, it is perhaps a preliminary step to more dynamic analyses to ascertain the nature and functions of the cognitional factors that are related to ethnic prejudices. Similarly, we should like to determine whether special cognitional processes are evident in persons showing little tendency to ethnic prejudices.

SOME DEFINITIONS

Before proceeding to a discussion of the problems we intend to investigate, we shall first attempt to delimit the meanings of various terms that are used in the course of this report.

By *prejudice* we shall mean: a readiness to respond to an individual or a group in terms of a faulty, inflexible generalization, the net effect of which is to place that person or group at some disadvantage. Thus, a prejudice would be such a generalization and a prejudiced individual would be a person holding such generalizations. Also, in terms of this definition, ethnic prejudice refers to the fact that the generalizations concern an individual as a member of a particular ethnic group, or concern that ethnic group itself. Other varieties of prejudice mentioned in the report similarly refer to the generalizations held in regard to the particular referent or object of the generalizations.³

By *cognitional process* we shall mean: such functions as reasoning, thinking, judgment, and the solution of problems. We omit from this definition any reference to perception, since we do not deal with perception directly.

By *ethnocentrism* we shall mean: the readiness to respond to an individual, group, object, or symbol identified with the self in terms of faulty generalization; the net effect of the generalization being to place the individual, group, object, or symbol at some special advantage.

For convenience we shall refer to all groups, whether religious, racial, cultural, or national as "ethnic groups." Hence, the prejudices toward various groups found in the study are henceforth ethnic prejudices. Naturally, we do not mean to imply the unity of all varieties of prejudice. Indeed, we support the contention that different types of prejudice may have different dynamic histories. But in young children, the subjects of our study, we believe that we would not be far amiss in saying that anti-Negro or anti-Jewish attitudes do not have profoundly different sources for the majority.

STATEMENT OF THE PROBLEM

If prejudice may be thought of as a readiness to respond with a faulty generalization, one might attempt to assess whether or not faulty generalizations are to be found generally in the individual's thinking. In terms of this hypothesis, prejudiced social attitudes would simply be special cases of a general incapacity to reason logically. Consider the nature of

³ We agree in this definition with the position taken by Vickery and Opler (56) that more emphasis should be laid on misjudgment in the definition of prejudice, hence the inclusion of a phrase concerning the faulty nature of these generalizations.

generalizing. The individual makes a group of observations of a number of different events; an effort is made to relate the events in some way; the individual stimuli are bound together by some common bond—a concept—and the generalization (an integration of discrete stimuli) is induced. This process, commonly termed concept formation, enables the individual to think and act in a more efficient fashion than would be the case if multitudes of unique observations of events were made that in no way could be considered as part of a class or species of events.

Considered as a set of inadequately formed generalizations, prejudices may then arise, in part, from a tendency to form inadequate concepts. We would therefore like to test the hypothesis following from these observations:

1. In situations requiring the formation of general concepts or generalizations, more prejudiced children tend to be deficient in forming adequate concepts; less prejudiced children tend to develop adequate concepts.

Thus, in solving inductive problems we shall be interested in the *process* of reasoning as well as in the outcome of the process: the attainment of the concept involved. We shall be particularly concerned with the "hypotheses" developed by each subject, how often they change, to what extent they persevere, how aids to reasoning given by *E* are utilized. The central aim shall be to determine whether significant differences in inductive reasoning exist between children who are more and less ethnically prejudiced.⁴

It has often been asserted that prejudiced persons do not "think straight"; somehow their

⁴ Alternately, we shall refer to those high in ethnic prejudice as prejudiced or more prejudiced. Those low in ethnic prejudice are referred to as unprejudiced or less prejudiced.

logical processes do not function adequately when the object of their prejudices comes under discussion. Hayakawa (20) has offered numerous instances of cases in which incorrect (i.e., biased) conclusions are drawn on the basis of evidence that may or may not be sufficient for drawing conclusions. Morgan and Morton (33) have shown how personal convictions may distort conclusions drawn from syllogisms. From a cognitive viewpoint, then, prejudices may arise and be supported by a failure of deductive reasoning. An individual has acquaintance with person A who is a member of group X. He observes this person's behavior and decides that since person A is behaving thus-and-so, and person A is a member of group X, then all other members (or even that members *other than A*) of group X also behave thus-and-so.

Woodworth (60) observed that formal logic is not akin to the reasoning processes of human beings. "Its principles and rules afford essential checks on the validity of an act of reasoning but they do not picture the actual process of reasoning" (60, p. 807). In considering the reasoning of children, Werner (58) and others have shown that syllogistic logic is farthest from their actual thinking mechanisms. It is not usual even for adults to draw conclusions based upon clearly presented premises. Occasionally, during a discussion of a scientific problem, for instance, enthymematic syllogisms may be employed. Thus, deductions in their normal setting follow distinctly unsyllogistic and nonformal principles.

In terms of our problem, perhaps prejudices arise in part from some inadequacies in the deductive processes; incorrect or invalid conclusions are drawn *generally* on the basis of evidence that may or may not be sufficient. From this we arrive at the following hypothesis:

2. In attempting to deduce conclusions from given premises, more prejudiced children tend to produce more numerous as well as more invalid conclusions than do less prejudiced children.

Again our interest will be divided between the *process* of deduction and the validity of the conclusions themselves. We shall attempt to learn whether the manner of presentation and the presence or lack of equivocality in the premises have a significant effect upon the conclusion reached. Here we come in contact with Frenkel-Brunswik's important prin-

ciple: intolerance of ambiguity. Do more prejudiced children draw inflexible conclusions on the strength of inadequate premises? Are they more adept at strictly formal logic? Do they resist ambiguous interpretations and make no allowance for alternate interpretations?

There remains one further aspect of the cognitive factors in prejudice. Tolman, in putting forward his revised theory of learning, describes what he has termed "cognitive maps" (55). In essence, the cognitive map is the "picture" the individual has drawn of the nature of the environment. It is the mental image of the "lay of the land" in the behavioral environment. Frenkel-Brunswik and her co-workers have found what amounts to a constriction of the cognitive maps of her ethnically prejudiced subjects (12, 14). Rokeach has termed this a "generalized mental rigidity" (44). In our definition of prejudice we have noted the relative inflexibility of the generalizations about people in which prejudiced persons engage. Perhaps this inflexibility is, as Rokeach has found, related to a general inflexibility of mind: a tendency for ideas or concepts to persevere even when they become inappropriate to the reality situation. In Rokeach's study, the longer and less appropriate method of solving a problem was adhered to in rigid fashion by the more prejudiced children.

Our hypothesis regarding mental rigidity is as follows:

3. Prejudiced children tend (a) to establish inefficient mental sets and (b) to employ inappropriate methods to break them; unprejudiced children tend (a) not to establish inefficient mental sets and (b) to employ appropriate methods to break them when they are established.

These are the problems this study sets out to investigate. Each hypothesis is taken up individually in the following sections and an attempt is made finally to bring the findings together into a partial explanation of the mechanisms of prejudice.

THE SCIENTIFIC SETTING

Human beings are generally capable of developing feelings of pleasure and displeasure, like and dislike, passion and

indifference regarding the widest possible array of stimuli in their environment. An individual may possess feelings of warmth and enjoyment toward many of his fellow men or he may despise and reject others. Normally, he comes into contact with comparatively few other human beings during his lifetime. It is remarkable then, that with the great array of potential objects of hostility available in the individual's environment, so many vent their hostile or rejective feelings upon persons or groups with whom they have had little or no contact. A person, a religious faith, a race—no segment is too large to be included as an object of hostility. How then, do such antipathies come about? What are their origins in the individual?

The attention of numerous investigators has been drawn to these problems. Some studies have examined the development and content of children's attitudes and have attempted to relate them to significant persons or events in the child's life. Lasker (26), in his early study of anecdotal reports of teachers, social workers, ministers, etc., analyzed the social influences bearing on the inculcation of attitudes in children. Horowitz (22), after a careful investigation of childhood attitudes in both rural and urban areas, concluded: "attitudes toward Negroes are now chiefly determined not by contact with Negroes, but by contact with the prevalent attitude toward Negroes." Zeligs and Hendrickson (65) were similarly oriented when they studied the reasons advanced by children to account for their racial attitudes. Generally, home and school social influences were given as the "cause" of their attitudes. These and other studies are premised on the belief that the child "learns" to be prejudiced by adopting the prevailing attitude pattern from the context of his immediate social environment. The very young child allegedly develops specific dislikes but is too young to generalize them because he has not yet the conceptual capacity to comprehend groups. As his conceptual powers increase he forms ideas concerning human groups of people and if the groups he identifies are objects of hostility for his parents or his contemporaries, then he in turn will feel hostility toward them. This process might be termed a "culture contact" or "exposure" theory of prejudice. No consideration is given to the functions which such prejudices might serve. The child merely conforms to the

group norms and learns the prejudices in the same fashion that he learns of other characteristics of his world.

Although prejudices against various ethnic groups are widespread, there exists at the same time a theme of tolerance for diverse cultural, religious, racial, and national groups. Many parents make special efforts to "teach tolerance." Many children nevertheless seem to develop the very hostile attitudes whose occurrence their parents seek to prevent.

To explain why some children do not bend as the proverbial twig, the common childhood phenomenon of contrasuggestibility might be advanced as an explanation. But contrasuggestibility would not account for cases of prejudice where the parents place no stress upon the need for avoiding prejudice or where ethnic groups are never discussed in the child's presence. Neither could it account for the reverse situation in which the child fails to develop prejudices in a cultural setting imbued with numerous hatreds. Here the child may rebel against or be unaffected by the group norms. Such mechanisms as "suggestibility" or "exposure" will be recognized, not as explanations or causes of prejudice, but as conditions of prejudice dissemination. Certainly, some children parrot the bigots to whom they are "exposed" but the persistence of bigotry in the thinking of the growing individual suggests that prejudice may serve important functions in his adjustment.

Considerable work has been done to determine the ages at which social attitudes appear. Goodman (17) studied manifestations of racial attitudes in nursery school children. Radke, Trager, and Davis (41) traced the ways in which groups' attitudes were shaped between kindergarten and the fourth grade. Lasker (26), Criswell (11), Moreno (32), Horowitz and Horowitz (23), and Horowitz (22) carried out similar types of investigations with various age groups. Others such as Meltzer (30) and Zeligs (63) studied time trends in group attitudes over several years.

Generally, these studies attempt to answer what may be described as "actuarial" questions: how prejudices appear at various age levels, how they change over time (most agree that they remain relatively fixed) and how variations in their manifestation, using alternate instruments, may be elicited. Little empirical work has been done to answer the question: What are prejudiced children like? And how did they get to be that way?

Some investigations into childhood attitudes have been concerned with the question of the relationship of prejudice to intelligence. Implicit in some of these studies has been the belief that tolerance is a function of increasing intelligence. In his comprehensive research on attitudes

toward the Negro, Horowitz (22) made a rough estimate of the relationship between hostility toward the Negro and intelligence. The attitudes of classes of "dull" and "bright" students were compared. No consistent differences were found. Zeligs and Hendrickson (65) computed the relationship between intelligence (measured by the Otis Group Test) and a measure of "generalized tolerance" administered to 178 sixth-grade children. They found $r = .31 + .05$. Minard reported (31) that 521 of 1,352 Iowa school children from the seventh through the twelfth grade had had intelligence tests already given them. By selecting 100 cases on a chance basis and computing a product-moment r of intelligence and scores on his B test,⁵ Minard found $r = .34 + .06$. Using the full sample and comparing scores on both the B and C tests, he found an increasing tolerance score significantly related to increasing intelligence. Horowitz (22), considering the differences between his own study and those of Zeligs and Hendrickson and Minard, decided in favor of the latter two studies in a notable display of scientific objectivity:

"In the light of the crude estimate of intelligence and the casual way in which the comparisons were made, it is suggested that Horowitz's data be eliminated from consideration in this context in favor of the tentative conclusion that there is evidence to support the hypothesis that brighter children tend to be relatively more tolerant than duller children of equivalent age" (p. 178).

Frenkel-Brunswik (12), refining the analysis of the intellectual component, reports that intelligence of 120 children aged 11 to 16 was only slightly correlated with ethnocentrism (prejudice) as measured by the California Attitude Scale I, but that it was found to be relevantly related to rigidity in thinking (p. 303). General intelligence as measured by IQ ratings appeared not to be as significant a covariate of ethnocentrism as was some special subfunction of intelligence designated as "rigidity" in the mental processes. The issue of intelligence as a covariate of prejudice remains in doubt, although, of the studies discussed, the California research was the most extensive. Because of its relevance to the present research we examine here, in some detail, the findings of the California Study.*

* Minard computed three scores for his test. The A score was based upon the full test. The B score was based upon 71 items involving moral judgments. The C score was computed from responses to items involving personal preferences (i.e., as in race of marital partner).

† The California Study referred to in this report comprises a series of investigations on personality and cognitional variables in the prejudiced

The concept of rigidity as used in the California Study may be understood as a general orientation of the mental functions to select and persevere a given idea, response tendency, belief, or expectation about the environment. A cognitional perseveration is seen as part of a tendency for rigidity to generalize into all areas of the individual's life. Thus it was found that more ethnocentric children tended to conceive of sharply dichotomous sex roles (i.e., "girls should only learn things that are useful around the house"). Masculinity was associated with strength and femininity with weakness. Furthermore, the California Study isolated what was termed an "anti-weakness" attitude of the prejudiced child. That is, the child preferred to be identified only with the dominant ingroup and to approve of the isolation or removal of "weaker elements" in the population.

The fact that the prejudiced child was found in this study to look with favor on ideas that tend to segregate his world and to dichotomize his experience into distinctly opposed groups (i.e., good and bad, acceptable and unacceptable, etc.), gives plausibility to the further finding that such children are "intolerant of ambiguity." Frenkel-Brunswik has given central importance to this concept in several papers (12-15) pointing out that the very nature of prejudice hinges on the child's incapacity to attribute multiple potential characteristics both favorable and unfavorable, to outgroups. The less prejudiced person can admit the existence of both sides of a question, can avoid universal evaluative judgments of others, even at the sake of self-consistency. Frenkel-Brunswik points out that intolerance of ambiguity is not equivalent to emotional ambivalence although the two are related. Emotional ambivalence involves the simultaneous desire to accept and reject, to agree and to disagree, and to love and hate. Intolerance for ambiguity precludes uncertainty. It involves rejection of those aspects of the environment that cannot be apprehended, given the individual's values and attitudes. Ambivalence refers to an emotional disposition to entertain conflicting feelings concerning an object; intolerance of ambiguity refers to the failure of recognition and rejection of conflicting or alternate potential characteristics in objects. Ambivalence toward the family was found to be associated with intolerance of ambiguity. Emotional ambivalence and cognitional intolerance of ambiguity each may be viewed as consistent aspects of a particular type of personality organization. Investigators, searching for relationships between personality functions and social attitudes, have tended to account for attitude structure and

prejudiced personality, carried out at University of California at Berkeley (see 1, 12, 13, 14, 15, 44).

attitude change in terms of personality organization.

Indeed, the role of personality factors in shaping attitudes has often resolved itself into the question: What type of personality is likely to find what sorts of social events congenial or disagreeable? To answer this question, personality types are isolated and their social sentiments deduced. An attempt to establish an empirical typological psychology may be found in the work of E. R. Jaensch and his followers (25). Jaensch, employing perceptual and psychological tests as a measuring rod, defined two basic perceptual (i.e., personality) types: the "liberal" type and the "integrated" type. The former is generally liberal in the political as well as "synesthetic" in the perceptual spheres. His percepts are "unstable, loosened up, even dissolved" (25, p. 110). On the other hand, the "integrated" type is found to possess "firmness, consistency and regularity" (25, p. 111) in both the cognitive functions and social attitudes. Needless to say, Jaensch viewed the latter type as preferred and as being closer to reality because there is not so much free play in memorial as in perceptual tests. He posited that each "type" had a "unitary style" integrating the perceptual, cognitive, and social spheres.

More recently, a number of investigations have looked into the relationships between social attitudes and certain other variables, both motivational and cognitive (27). Newcomb related changes in social attitudes to functions of certain personality variables in a college community (36). Murray and his co-workers (35) have demonstrated the relationships that hold between personality functions and sociopolitical sentiments.

Smith (52) notes the close relationships of personal values and political attitudes. His problem interests us in regard to the present study since it serves to point up the differences between this approach and that taken by the numerous studies¹ associating "need," "value," "personal relevance," etc., to attitudes. Smith reasoned that personal values have been shown to direct and determine cognitive experience. Hence, since attitudes are the functional representatives of perception in relation to cognized objects, then personal values may also determine attitudes.

The present study never reaches the stage of defining the personally relevant values or needs of the subjects, although

¹ Current literature in perception theory is waxing heavy with studies aimed to clarify these relationships (5, 7, 8, 29, 40). Still others are waging the battle for a "non-separatist" view of cognitional and motivational processes (21).

an attempt is made in this direction. The question that we aim to answer, namely, "What are the cognitional correlates of prejudice?" remains, nevertheless, as a legitimate and separable problem. Let us then examine the results of that aspect of the broader California Study dealing with memory and perception in the ethnically prejudiced child.

Forty-two sixth-, seventh- and eighth-grade subjects who had already been administered the California Attitude Scale I² and other personality and social belief tests were presented with a story (termed a "milieu characterization") involving the relationships of school children and their attitudes toward recent arrivals in the school. The newcomers are characterized briefly. One is Negro and one Jewish. The story relates the behavior of the "old" group of children toward the "newer" ones. Conflicts, acts of aggression and defense are included, ending with the new children attempting to defend themselves against the older ones. The task is to recall and reproduce the story. The findings in general support the author's contention that the more prejudiced children tend to distort the story to conform to their convictions about each of the ethnic groups. The more prejudiced children select the aggressive sequences for recall significantly more frequently than do the less prejudiced children. Another important difference in recall is the greater number of omissions of significant aspects of the story, not fitting the usual stereotypes held by the low-prejudice children over the high-prejudice children. The interpretation given is that the low scorers emphasize the "positive and nurturant aspects" of the story rather than the many cases of overt aggression. It is further found that more prejudiced children tend to become concentrated on the details and description of the people in the story or to wander off into fantasy using the story as a stimulus. Thus, Frenkel-Brunswik concludes: "It is in this manner that a rigid, segmentary, cautious approach goes with one that is disintegrated and chaotic, sometimes one and the same child manifesting both patterns in alternation or in all kinds of bizarre combinations. As do negativism and distortion in general, both these patterns help avoidance of uncertainty, one of them by fixation to, the other by tearing loose from the given realities" (p. 126). Being concerned with demonstrating the general characteristic of rigidity manifested in many ways and under many conditions, Frenkel-

² Fifteen hundred subjects between 11 and 16 years of age were administered this scale.

Brunswik did not distinguish between perseveration on a given theme, assimilation to a stereotype, and adherence to a set of prepared attitudes—three types of rigidity that appear to characterize the results reported above. The central factor of rigidity in the thinking of the more ethnically prejudiced children appears to have been well established, however.

The perceptual experiments consisted largely of presenting the subjects with ambiguous stimuli. Unfortunately, since these studies are not completely reported upon, it is difficult to evaluate the reports. One experiment with 14 subjects employed a disk-shaped reversible figure-ground pattern and measured time to shift and spontaneous shifting. The results, however, were inconclusive. In a second experiment, a series of pictures were presented in which the likeness of a dog gradually emerged as the image of a cat. The more prejudiced children perseverated, holding the image of the dog over a greater number of steps in the sequence than did the less prejudiced children. There was also a greater degree of haphazard guessing in the center of the series by the more prejudiced children. Additional studies were reported in which hues and numbers were progressively changed and similar results were obtained. Particularly interesting is the fact that the prejudiced child not only tended to cling to a given percept once it had been made but also devised means for ignoring or obliterating the incongruities of the changeable (i.e., fickle) stimuli before him.

In an extension of his study of "generalized rigidity" in ethnocentric adults, Rokeach (44) gave ethnocentric children two problem-solving situations involving the establishment of a mental set toward a particular solution. He demonstrated that the more ethnocentric child tended to adhere to the less appropriate solution when an alternate, more appropriate, solution was possible. The less ethnocentric child showed less rigidity by more frequently selecting the shorter solution which Rokeach defined as more "adaptive."

Several general conclusions may be drawn from the studies noted above. First, the prejudiced child appears to be cognitively more rigid than the unprejudiced child. He tends to select for recall and recognition only certain aspects of the stimuli bombarding him: they stabilize his phenomenal world into relatively fixed and dichotomized categories. Categorization assists the child to deal with the discrepant and vaguer aspects of his

environment that, objectively, do not fit the categories. He both avoids and distorts reality to maintain the necessary categorical views. When forced to face ambiguities, the prejudiced child tends to assimilate his percepts to one or the other of the alternatives and to persevere the fixated alternative. Indefiniteness is apparently anathema to such children. Moreover, even when the alternative selected is inappropriate or maladaptive and the more appropriate and adaptive alternative is presented the individual fails to utilize it because of the tenacity of the original fixed set.

It must be pointed out that the relationships referred to above are by no means positively established as invariant aspects of the makeup of the prejudiced individual. Indeed, the patterns empirically established by the work of the California group have large variances as indicated by selected cases given intensive personality study. Although the majority of the findings mark off the groups from one another in fairly consistent manner, there are notable individual differences requiring dynamic analysis to be understood.

METHODOLOGICAL CONSIDERATIONS AND PROCEDURES

Plan of the Study

This investigation compares the performances of relatively prejudiced children and those of children who are relatively unprejudiced, on a group of tests, interviews, and ratings concerned with the functioning of the higher mental processes. The tests themselves are described in detail in the chapters that follow. Here we should like to discuss some of the general problems encountered in testing attitudes in young children. Also we should like to consider the subjects of

the study and the general procedures employed.

The first necessary task of the study was to set up some measure of the presence or absence of ethnic prejudices. We assumed that any test of such a variable, especially as it concerns young children, would not be likely to tap all or even most of the ways in which ethnic prejudices might be expressed. Pencil-and-paper tests could not be used since the subjects could not read or write sufficiently well. Some form of projective test suggested itself for convenient use in a situation defined for the child as a "game." Two tests were decided upon. The first is an information test, requiring the child to tell what he knows about various ethnic groups. We hoped with this instrument to discover whether knowledge of a group was necessary for a child to express definite attitudes toward it. Additionally we anticipated that some expression of attitude would be obtained spontaneously. The second test presents a group of statements attributed to someone else, who places various ethnic groups in strongly prejudicial or ethnocentric terms. We hoped here to obtain agreement or disagreement with the statement together with spontaneous reasons the child might advance for holding these views. The first test produced inadequate results and was discarded while the second test proved valuable and is the basis for our final groupings.

We decided that the subjects would be scored for prejudice on a roughly linear four-point scale. We followed this procedure for two reasons: (a) we wished to score each child in such a way that the more prejudiced group would be clearly different from the less prejudiced group. A four-point scale would first differentiate two extreme groups. The intermediary groups could then receive careful individual analysis before being categorized as either prejudiced or unprejudiced. (b) From a four-point scale we could proceed to classify each child into either a more prejudiced or a less prejudiced group. Our desire was to define only two groups: those high and those low in ethnic prejudices.

All children who were finally classified into either of the two categories at the low-prejudice end of the scale were called unprejudiced and formed Group A, while all children falling into either of the high-prejudice categories were classified as prejudiced and formed Group B.

It may be of some value to point out the differences in classification of more and less prejudiced children between the California Study and the present one. To test their hypotheses on cognitive and personality variables, the extreme quartiles of the scores on the California Attitude Scale I were selected. Of the individuals in these extremes, 120, or 8% of the

total of 1,500 subjects who were originally tested, were selected for intensive study. Hence, both the more prejudiced and less prejudiced groups contain the extreme 4% of the total at each end of the scale of prejudice. On the other hand, we administered all tests to all subjects, deriving a final two-point scale. Assuming that our test is valid and our categories reliable, children whose prejudice scores would lie at the medial part of the four-point scale would attenuate the findings no matter in which group they happened to be placed finally. If there are distinct "types" of prejudiced and unprejudiced persons, the results would not show up so clearly as they might if we had taken the extreme quartiles for special testing. We have attempted to overcome some of the difficulties inherent in our classification by defining the more prejudiced group in such a way that only those showing spontaneous and indisputable evidences of group antagonisms were classified in the B Group. The latter, consequently, may be considered to contain "pure" cases of prejudice. The A Group on the other hand not only contains the cases clearly classified as less prejudiced (at one extreme of the four-point scale) but also contains a number of doubtful cases whose classification was decided on only after the final rationale for the two groups was worked out. These considerations should be borne in mind in evaluating the results of this study. While our categories might imply that we are convinced of the existence of "types" of persons based on personality variables of which prejudice is one component, no such implication is intended. However, the nature of the study is such that conclusions may be drawn on this point even though final proof of any such dichotomy remains for further research. A paper by Frenkel-Brunswik (14) is aimed in this direction.

General Procedure

We first established contact with the School Department of the town of Brookline, Massachusetts (a large residential community lying adjacent to and south of Boston) and were put in touch with the Michael Day Driscoll School, one of eight public elementary schools. Arrangements were made to carry out the study with both second-grade classes as subjects. In conjunction with the principal and the two teachers involved, plans were made to collect the data over a five-month period. The *E* was introduced to the children as an assistant who would be helping the teachers during the year by trying out some new "games" in each of which they would have an opportunity to participate. During the first five weeks of the school year, the *E* acquainted himself with the children, permitting them an opportunity to

recognize him as a daily visitor. The *E* took his lunch with the second grade and went to recess with them each day, ensuring that he would be recognized as a regular member of the staff.

At a prescribed time, just prior to the start of the testing sessions, each class in turn participated in a discussion led by the *E* on the subject of "Peoples of the World," a topic chosen in connection with the social studies curriculum of the second grade. The discussion lasted about 25 minutes and about 80% of the children of each class participated by telling what they knew of the customs of various peoples. The discussion was intended to give the *E* a point of departure for the administration of the attitude tests which followed shortly.

When the testing sessions began the procedure adhered to was as follows: The *E* entered each class on alternate days at about the same time in the morning. A child was selected (all were taken in alphabetical order of the surname) and left with the *E* for his office. At the conclusion of a session, the child would be asked to bring to the office the child whose turn it was next. Sessions were held each day for about three hours, the *E* interviewing between five and nine children per day.

The problem of rapport, so frequently encountered in research or testing where the *E* has only limited contact with the child, was not a factor in this study. By the time the *E* began testing, he had been accepted as a normal part of the class structure. The start of the testing sessions found the children vying with one another for a chance to "go to the office" with the *E* for "games." The children soon learned that they were to go alphabetically, though some pleaded with the *E* to take them ahead of another whose turn fell earlier. This unique situation would seem to provide fertile ground for obtaining rich material, and the *E* was not disappointed in this regard. The subjects were natural and uninhibited, some overly exuberant at the chance to play "games" in the middle of the day. Most of the children attended to the tasks presented them and participated thoroughly. There were few exceptions to this rule. As a consequence few records had to be discarded for lack of responsiveness to the situations. In general, the research situation was unusually good.

The data were collected between October 10, 1949, and February 7, 1950. With a few exceptions each subject was seen on four different occasions. In certain cases where the data were not clear because of an interruption in the original testing session or some other extrinsic cause, a repeat session was held if the nature of the test permitted. A total of 245 testing sessions was held averaging 20 minutes per session. All testing was done individually.

Subjects

A total of 65 subjects participated. Complete sets of data are available for 57 subjects and partial data for 3 subjects who left school during the year. The remaining 5 subjects took the attitude test but none of the remaining tests, by reason of leaving school in two cases and because of indecisive responses on the attitude tests in the other three. Hence, the data reported upon in this study are drawn from the responses of 60 subjects.

There were 34 girls (57%) and 26 boys (43%) comprising the total group. Their average age at the start of the study was 6 years 11 months. The mean age of the boys was 6 years 10 months; that of the girls was 7 years 0 months, the differences being insignificant.

An analysis of the occupations of our subjects' fathers reveals (Table 1) that more than half either owned their businesses, retail and wholesale firms, or had supervisory or managerial positions in some business. Another group of 17 fathers were in some profession. Of this number, 5 were physicians and 5 attorneys. There were 2 engineers, a dentist, a pharmacist, an insurance broker, an accountant, a sports editor, and a teacher. A group of 9 parents were classified as "skilled." Of these, 7 were salesmen, 1 was a machinist, and 1 a toolmaker. In addition, there was one unskilled worker, a building superintendent, and there was one working mother who owned her own small business, the father being dead.

From a socioeconomic point of view, the majority of our subjects' families would fall into the middle to upper middle class group. Most owned their own homes and had cars of recent model. Moreover, most of the homes were embellished with expensive furnishings, television sets, and other marks of middle-class status. The school itself, which drew its population from the surrounding neighborhood, is located in a suburban residential section of the town, the majority of the homes being privately owned. Rentals for the area were relatively high.

TABLE 1
OCCUPATIONAL GROUPING OF FATHERS
OF 60 SUBJECTS

Occupational category	<i>N</i>	%
Professional	17	28
Business-managerial	32	53
Skilled	9	15
Unskilled	1	2
Other	1	2
Total	60	100

From the point of view of religious preference, there were 5 Protestant children, 9 Catholic, and 48 Jewish children, representing respectively 5%, 15%, and 80% of the total. A word concerning this distribution is in order. Since this study concerns itself with the general associations between prejudices and certain cognitive functions, we are not particularly concerned over the ethnic make-up of our sample. Membership in a particular ethnic group should have no direct bearing on our problem. Frenkel-Brunswik et al. (1, 13) have found that the particular background of the child, including ethnic background and variety of familial structure, has a striking relationship with the child's personality organization and attitude structure. Nevertheless, we may still ask: Are there patterns of mental organization and functions that are related to ethnic prejudices and common to all ethnically prejudiced persons? If we find that such patterns of mental functioning do exist, we should feel more strongly that deep-seated prejudices may have some common base in mental structure irrespective of their specific cultural origins.

Why, it may be asked, are children the subject of this study and why are these children seven-year-olds? The California Study of ethnic prejudices studied children between the ages of 11 and 16 years of age. Split-half reliability of their responses on the scale testing ethnocentrism ranges from .82 to .90, "indicating that ethnic prejudice is a consistently and firmly established pattern not later than at the earliest age levels studied" (12, p. 296). We felt that, in order to study the earliest manifestations of ethnic prejudices, we should tap them when they are not yet consistent and rationalized. Similarly, we wanted to know whether special cognitive functions could be demonstrated as an early childhood concomitant of prejudice. Knowing the status of ethnic prejudices at various levels of development, we may assess the consistency of any relationship between prejudices and other variables at each stage. A question that begs for research is: Can we determine which variables are most salient in predisposing to prejudice at any age, and are these variables to be found also in the older, already prejudiced child? Are there diagnostic patterns to be found in childhood that will be predictive of prejudices? Our research is concerned with a necessary first step: defining the relationship of cognitive functions to ethnic prejudices but in young children rather than children approaching or in adolescence.

Another reason for selecting seven-year-olds is a finding of Allport and Kramer (4) that adults recall the origin of their prejudices as dating from the ages 6 to 16. The California Study touched the upper end of this range, while the

present investigation concentrates on the lower level. Together with the studies of Meltzer (30), Horowitz (22) and Zeligs (64), etc., we are gradually finding confirmation of the Allport-Kramer finding. This study hopes to add further to the data on this point. Finally, we felt that since prejudices are undoubtedly only recent acquisitions in seven-year-olds, clues to processes and techniques aimed at reduction of—or prevention in the case of other as yet unprejudiced children—ethnic prejudices might be found at the earliest point at which prejudices manifest themselves.

ESTABLISHING THE PREJUDICED AND UNPREJUDICED GROUPS

Our first task was to construct a test that would measure the relative presence of prejudice. Under the circumstances in which the study was carried out, in the setting of a public school, it was felt best to rely on the responses to verbal material rather than employ free doll play or miniature life toys. We turn here to an examination of the tests and an analysis of the results.

Our measure of prejudice is an Ethnic Attitude Test, a structured projective questionnaire dealing with attitudes toward various ethnic groups. We decided to deal with only 7 major ethnic groups in constructing our test. Other items were added to make a total of 10 (Appendix A). After pretesting a number of different methods of presenting the questions on a group of eight-year-old children, we constructed a test consisting of statements that are highly prejudicial. Consistent with our definition, we felt that a prejudiced child would tend to agree with statements involving anti-ethnic group prejudices. On the other hand we felt that an unprejudiced child would tend to disagree with such statements. More prejudiced children would be likely to enlarge upon a prejudiced statement while less prejudiced children would be more likely to enhance their denial of the statement with facts or atti-

tudes indicating the acceptance or tolerance of the accused groups. Similarly, we felt that, together with the rejection of outgroups, more prejudiced children would reject statements antagonistic to their own group and espouse its virtues instead.

Only six of the seven ethnic groups dealt with in the questionnaire were employed to derive a final estimate of prejudice. These groups are Mexican, Catholic, Jewish, American, colored (Negro), and white. German, Italian, and Russian people were excluded from the criterion groups of the EAT because of the comparatively few subjects who could define these groups. Christian (Gentile) was also excluded due to the number of incorrect identifications (many of the children did not distinguish Christian or Gentile from Catholic). Chinese were excluded since a large proportion of the children had been stimulated by pictures and stories of Chinese in native costume in their class. It was felt that the remaining six groups would give a clearer estimate of prejudices. With the exception of the Mexican group, the children had had personal contact with members of each of the other groups. We decided to retain the Mexican group since we wished to determine whether prejudices found in attitudes toward the five other ethnic groups would also be present in regard to a group with whose members none of the subjects had ever had any personal contact.

The results of the EAT are presented below in two ways: (a) An analysis is made of the various responses according to whether or not the subject agreed or disagreed with the statement; and (b) An analysis is made of the classification of the subjects into "more prejudiced" and "less prejudiced" categories. First, we turn to an analysis of the results of the EAT on the agree-disagree dimension.

The responses are classified into 11 categories.

These are:

Category

(A) *Unconditional agreement*, the individual categorically agrees with the prejudiced statement.

(B) *Conditional or partial agreement*, the individual agrees with only some of the rejecting aspects of the statement or qualifies his agreement in some way.

(C) *Enhanced agreement*, the individual adds further rejecting remarks to those presented in the statement.

(D) *Partial agreement, partial disagreement*, the direction is equivocal.

(E) *Unconditional disagreement*, the individual categorically denies the prejudicial remarks made about the group.

(F) *Conditional or partial disagreement*, the individual does not agree with the statement but challenges a part of it or qualifies his disagreement.

(G) *Enhanced disagreement*, the individual denies the statement and adds to his denial by attributing characteristics to the group opposed to the statement or refuting it.

(H) *Disagreement on moral grounds*, the individual implicitly disagrees with the statement by saying in effect, "You must not say such things about these people."

(I) *Equalitarian disagreement*, the individual implicitly disagrees with the statement by remarking, for example, "They're as good as us" or "We're the same as they are."

(J) *Don't know*.

(K) *Miscellaneous*, in general irrelevant remarks.

Making use of these categories, Table 2 presents the results of the EAT. Of particular interest to this study is the fact that only 58 or 16.8% of the responses are clearly prejudicial in nature. However, since responses to statements on American and white people reflect a rejection of patently ethnocentric sentiments rather than a "rejection" of ethnic groups, we may eliminate "American" and "white" agreements to their respective statements and recompute the percentage of prejudiced responses. This recomputation reveals that there are 41 or 12% prejudiced responses.

If we combine columns, E, F, G, and I (categories of clear-cut disagreement with

TABLE 3
ANALYSIS OF RESPONSES ON EAT TOWARD SIX ETHNIC GROUPS

Ethnic group	Categories											Total	
	Agree			Disagree									
	A	B	C	D	E	F	G	H	I	J	K		
Mexican													
<i>N</i>	5	4	3	1	6	14	4	0	7	8	6	58	
<i>%</i>	8.6	6.9	5.2	1.7	10.3	24.1	6.9	0	12.1	13.8	10.3		
Catholic													
<i>N</i>	2	4	1	3	4	6	5	6	18	5	5	59	
<i>%</i>	3.4	6.8	1.7	5.1	6.8	10.2	8.5	10.2	30.5	8.5	8.5		
Jewish													
<i>N</i>	3	0	2	2	8	9	18	5	6	3	1	57	
<i>%</i>	5.3	0.0	3.2	3.8	14.0	15.8	31.6	8.8	10.5	8.1	1.8		
Negro													
<i>N</i>	6	9	2	3	5	16	13	0	3	2	1	60	
<i>%</i>	10.0	15.0	3.3	5.0	8.3	26.7	21.7	0.0	8.0	3.3	1.7		
Subtotal	16	17	8	9	23	45	40	11	34	18	13	234	
White													
<i>N</i>	1	0	3	2	4	2	12	1	18	1	12	56	
<i>%</i>	1.8	0.0	5.4	3.6	7.1	3.6	21.4	1.8	32.1	1.8	21.4		
American													
<i>N</i>	4	3	6	4	6	1	10	1	9	6	6	56	
<i>%</i>	7.1	5.4	10.7	7.1	10.7	1.8	17.9	1.8	16.1	10.7	10.7		
Totals	21	20	17	15	33	48	62	13	61	25	31	346	
<i>N</i>	6.1	5.8	4.9	4.3	9.5	13.9	17.9	3.8	17.6	7.2	9.0		
<i>%</i>													

the statements presented to the subjects) we find that there are 142 responses, or 58% of the total, again eliminating the responses to "white" and "American." Of the 41 prejudiced statements, 12 are against Mexicans, 7 against Catholics, 5 against Jews, and 17 against Negroes. Divided on the basis of a "generally accepting" or "generally rejecting" attitude and eliminating questionable responses (especially some of the responses in categories D and H) we find (Table 3) that in order of "acceptance" are Jewish, Catholic, white, Negro, Mexican, and American. In order of "rejection" are Negro, American, Mexican, Catholic, Jewish, and white.

It is interesting to note in Table 3 that Mexicans are rejected by 21% of the subjects even though no child had had any personal knowledge or acquaintance

with any Mexicans. Of the five subjects rejecting Jews, two are Jewish and three Catholic. In general there are about four times as many accepting attitudes as there are rejecting attitudes.

If again we regard only the first four ethnic groups in Table 3, we get a clearer picture of the pattern of acceptances and rejections. To bring this pattern into sharper focus, we present the results of accepting and rejecting responses for the Mexican, Catholic, Jewish, and Negro groups (Table 4).

The ratio of accepting to rejecting attitudes stands at about 3.7/1. Jews are accepted more and rejected less than either the Mexican or Negro group. p is less than .02 for the differences between the Jewish-Negro frequencies and is almost at the .05 level of probability for the differences between the Jewish-Mexi-

TABLE 3
ACCEPTING AND REJECTING RESPONSES BY SUBJECTS* ON THE EAT

Ethnic group	Accepting	Rejecting	Don't Know	Other	Total
Mexican					
N	31	12	8	6	57
%	54.4	21.1	14.0	10.5	
Catholic					
N	39	7	5	5	56
%	69.6	12.5	8.9	8.9	
Jewish					
N	46	6	3	1	55
%	83.6	10.9	5.5	1.8	
Negro					
N	37	17	2	1	57
%	64.9	29.8	3.5	1.8	
White					
N	36	4	1	12	53
%	67.9	7.5	1.9	22.6	
American					
N	26	14	6	6	52
%	50.0	26.9	11.5	11.5	
Totals					
N	215	59	25	31	330
%	65.2	17.9	7.6	9.4	

* Since there are typically only one or two responses per subject, this table represents the number of subjects responding to each ethnic group on the dimension of agreement and disagreement with the statement.

TABLE 4
ACCEPTING AND REJECTING RESPONSES TOWARD FOUR ETHNIC GROUPS

Ethnic group	Accepting	Rejecting	Don't Know	Other	Total N
Mexican					
N	31	12	8	6	57
%	54.4	21.1	14.0	10.5	
Catholic					
N	39	7	5	5	56
%	69.6	12.5	8.9	8.9	
Jewish					
N	46	5	3	1	55
%	83.6	9.1	5.5	1.8	
Negro					
N	37	17	2	1	57
%	64.9	29.8	3.5	1.8	
Totals					
N	153	41	18	13	225
%	68.0	18.2	8.0	5.8	

can frequencies.⁹ The Jewish and Catholic groups are not significantly different in terms of the number of acceptances and rejections by our subjects. The Catholic group's acceptance-rejection ratio is not significantly different from any of the remaining three, although p is just short of the .05 level for the Catholic-Negro pairing. These findings indicate that a hierarchy of acceptances and rejections exists with the Jewish group heading the acceptance order and Negroes leading the rejection list. Hence, the Jewish group is much less frequently rejected than are other groups, except for the Catholic group. This is to be expected since the major identification group is usually placed highest on most tests of attitude. The fact that nine of our subjects are Catholic increases the frequency of Catholic acceptances and concomitantly probably decreases the number of Catholic rejections.

Returning to Table 3, we find that the "white" group is rejected by only four subjects, but more than one-fifth of the responses are classified in the "other" column. One fourth of the responses to American are "rejecting." Less than half of the responses are "pro-American." These latter two results are somewhat surprising in view of the fact that all of our subjects are both white and American. It may be that the large number of irrelevant responses to the statement on "whites" reflects an indecision on the part of some of the children who, recognizing themselves as white, cannot agree that they are not as good as others in some way. It may also indicate that some of the children are confused that others should cast them in negative light. The large number of rejections of the statement concerning Americans seems to vio-

late the principle that one's own group is given highest status on attitude tests. It should be emphasized that disagreement with the strongly "pro-American" statement does not in itself constitute the "rejection" of Americans. Rather, it would seem to indicate a tendency by some children to avoid the idealization of the ingroup. A consideration of Column I of Table 2 would seem to confirm this view. It will be noted that fully 61 or 18% of the 346 responses are classified as "equalitarian" disagreement. The subject says in effect (if not in actuality) that "I'm not any better than or different from other people" and "There are no 'better' and 'worse' people, we're all alike." Hence a considerable number of our subjects would appear to be anti-ethnocentric.

One further problem remains: how consistent are the subjects in their acceptances and rejections of the various groups discussed on the EAT? The answer to this problem will lead us directly to our problem of selecting our two major groups since it will tell us *how many* prejudices an individual subject displays and *how strongly* they are held. In Table 5, we present the degree of individual consistency on attitudes toward four ethnic groups.

TABLE 5
DEGREE OF INDIVIDUAL CONSISTENCY OF
ATTITUDE TOWARD FOUR ETHNIC
GROUPS

Degree acceptance	N Cases	%
a. Accept 4	15	
b. Accept 3	12	
c. Accept 2	8	
Subtotal	35	58
d. Accept 3 Reject 1	7	
e. Accept 2 Reject 2	6	
f. Accept 1 Reject 1	5	
Subtotal	18	30
g. Reject 2	3	
h. Reject 3	4	
Subtotal	7	12
Totals	60	100

⁹Chi square for the former pair is 6.22, and for the latter it is 3.57.

The combination of groups a, b, and c yields 35 subjects or 58% of the cases in which no prejudices are evident. Another group of 18% (or 30% of the cases) accept at least 1 group and reject no more than 2 groups; but, more important for the present study, this group shows varying degrees of inconsistency of attitude—they each have at least one rejection as well as at least one acceptance of an ethnic group. The third group is consistently rejecting in attitude. No individual rejected all four ethnic groups. There are fewer than four acceptances and rejections in some groups due to either lack of knowledge about an ethnic group or to the presence of irrelevant responses. Hence 70% of the subjects show marked consistency of attitude, either accepting or rejecting. Consequently, we can now establish that the 41 rejecting responses were made by 25 subjects, while 35 subjects made no rejecting responses whatsoever. Hence, using the EAT as our primary measure of prejudice, we can proceed to an analysis of the responses of the 25 subjects responding with at least one ethnic group rejection.

Our major task now remains: to select that group of children we are to call "more prejudiced" and another group that we are to call "less prejudiced." We have seen that there is a marked consistency in the direction of the attitudes of a large proportion of our subjects. Hence, we might select our two groups from the extremes of the distribution of responses to the EAT. Those accepting 4 or 3 groups would constitute our less prejudiced and those with a preponderance of rejections would make up our more prejudiced group. This technique has the added advantage of being highly objective. We chose, however, a different technique, somewhat less objective, that we nevertheless feel is at least equally valid. After reading through the responses of all the subjects a set of criteria was drawn up in accordance with our definition of prejudice. These criteria form a four-point scale from most to least prejudice. We do not assume equal intervals between the points, nor is this a Guttman-type scale. We believe, however, that it fulfills the requirements of

a continuum: the quality and quantity of the major variable dealt with in the scale increases in relatively systematic fashion from point to point. Such a scale has one major advantage, crucial to our study, over a purely objective method enumerating the quantity of ethnic prejudices: it takes into account the *intensity* of the attitude as judged by the E. Hence, one case of ethnic prejudice exhibiting a high degree of hostility against a single group may be rated as more prejudiced than another case in which mildly held prejudices against two ethnic groups are found. The criteria for the fourfold classification follow:

Group 1. Very Unprejudiced

- a. Denies unwarranted assertions of virtues of own group.
- b. Denies or enhances denial of negative traits ascribed to ethnic group.
- c. Gives equalitarian response to ethnic group comparisons.
- d. No evidence of spontaneous rejection of an ethnic group.
- e. Does not place ethnic group or member at a disadvantage or deny his virtues when he knows they exist.

Group 2. Somewhat Unprejudiced

- a. Does not spontaneously attribute virtues to ethnic groups.
- b. Does not deny attributed negative traits to ethnic groups.
- c. Engages in moralistic admonitions (you must be good to everyone; you mustn't say such things).
- d. Indirect or mild rejection of an ethnic group or individual who is identified by his group membership.
- e. Rejection on aesthetic grounds (I don't like the color of him).
- f. Moderate ethnocentrism.

Group 3. Somewhat Prejudiced

- a. Agrees with statements attributing negative traits to ethnic groups.
- b. Tends to generalize a dislike or rejection from individual to group.
- c. Multiple hostile attitudes toward ethnic groups.
- d. Strong display of ethnocentrism.
- e. Spontaneous enhancements of attributed negative traits.

Group 4. Prejudiced

- a. Spontaneous expression of hostility against ethnic groups aside from statement.
- b. Enhanced spontaneous additions to attributed negative traits with rationalizations.
- c. Multiple hostile attitudes, intensely held.
- d. Rejects or denies existence of any positive characteristics of ethnic groups.
- e. Attribution of negatively valued traits (bad, smell, steal, fight, etc.)

In order to qualify for classification in a particular group, the child's responses must fall within at least one of the operational criteria given for each group. Hence, the appearance of only one of the items in each category is sufficient to warrant its classification in that category.

Two subjects could not be classified for various reasons and were consequently dropped from the list. In order to establish the reliability of the scoring procedure a graduate student at Harvard University specializing in psychology and with considerable experience in classifying thematic material, independently scored the responses to the EAT using the same criteria as the author.

Over-all agreement for all four categories is 48%. However, only two subjects were rated more than one category above or below that assigned by either rater. Pearson r correlating positions assigned by the two raters is .62.

The major discrepancies exist between ratings assigned to categories 1 or 2 and between 3 and 4. There are only 6 cases in which a subject assigned to either 1 or 2 is classified by the second rater as falling into 3 or 4.

Our next procedure was to establish two major categories of subjects: those who are "more prejudiced" and those who are "less prejudiced." We decided that all subjects assigned to categories 1 and 2 above would be classified as Group A (the less prejudiced group) and all subjects assigned to categories 3 and 4 above would be classified as Group B (the more prejudiced group).¹⁰ On this

¹⁰ Adjustments in ratings were made after the two raters consulted concerning their discrepancies. In all but one case the discrepant subjects were placed in Group A. This was done to ensure that the "more prejudiced" group would

basis, reliability of the two sets of ratings was again computed by chi square. With only 6 subjects classified in Group A by one rater and in Group B by the other, chi square is found to be 33.26 which is significant at the .001 level of probability.

Having established the reliability of the rating technique, we assigned our subjects to their respective groups. There are 42 children (70%), 27 girls and 15 boys in Group A; 18 children (30%), 10 boys and 8 girls making up Group B. The sex differences between the two groups are not significant and the sex distribution is also not significantly different from the total sex distribution for the group as a whole. Similarly there are no meaningful differences between the two groups on the basis of father's occupation, age, or religion. There are 12 Jewish children, 4 Catholic children, and 1 Protestant child in Group B.

Data on intelligence are available for 54 of our 60 subjects—38 in the less prejudiced group and 16 in the more prejudiced group. The subjects were administered the Pinter-Durost Intelligence Test, Scale I, Form A, as a routine part of the guidance program of the School Department, Town of Brookline.

The mean IQ for all 54 subjects was found to be 114.1 ± 11.2 . The range was from 85 to 140. Median IQ for the group was 112.5.

The mean IQ of our unprejudiced group is 115.5 ± 10.7 , while the mean IQ of the prejudiced group is 110.8 ± 12.4 . The critical ratio for the difference between these two means is 1.4 and is, therefore, not statistically different. The range of IQ scores in Group A is 96-140 and that in Group B is 85-134. The median IQ for Group A is 113.5 and the corresponding median for Group B is 110. These data are summarized in Table 6. The lack of difference in intelligence test scores between Groups A and B is similar to the finding of the California Study. In both investigations there is a slight tendency for increasing intelligence to be associated with a lack of prejudice, but this tendency does not reach statistical significance.

In the following sections, we examine in detail the thinking of our subjects with regard to problems that commonly form part of most intelligence tests. Since we have found no differences to exist between the general intelli-

have maximum homogeneity on the attitude dimension even at the expense of contamination of the "less prejudiced" group with persons of equivocal attitudes as judged by the divergence of the raters.

TABLE 6
RELATION OF IQ TO PREJUDICE RATING

Measure	Group A (N = 38)	Group B (N = 16)	Total group (N = 54)
Mean IQ	115.5	110.8	114.2
Sigma	10.6	12.4	11.2
C.R.	1.4		
Median IQ	113.5	110.0	112.5
IQ Range	96-140	85-134	85-140

gence of prejudiced and unprejudiced children, we might expect that there should similarly be no differences between the two groups on tests that, for the most part, are likewise tests of intelligence. Should we find striking differences between the two groups on problems involving concept formation, deductive logic, and mental set not explainable from general intellective factors, to what may we attribute performance failures on some tests of the higher mental functions? As a preliminary hypothesis, we suggest that, since prejudices involve the use of reasoning that by objective standards is faulty, those children in Group B who fail our tests or give poor performances in attempting to solve the conceptual problems given them are less intelligent than those in Group B who pass these tests. Implied in this hypothesis is the suggestion that even as early as the age of seven two types of "prejudiced children" are to be found: (a) those whose prejudice forms an integral part of personality, permeating all aspects of behavior and appearing on our tests as a failure to reason adequately, and (b) those whose prejudices are not deeply rooted in the personality but who have learned the culturally accepted modes of responses to various ethnic groups as part of their "home training" and express such learning through the stereotypes and clichés commonly found in prejudiced adults. We would suggest that children who are poor in abstract abilities, for example, who at the same time manifest ethnic prejudices are likely to be of the former "type" while children who are both adept at abstract conceptual thinking and show prejudices are likely to be among the latter "type." It is further suggested that it is *that* aspect of general intelligence rendering an individual capable of forming adequate generalizations or arriving at adequate conclusions that is generally depressed in children who are more prejudiced. While we have not attempted to item-analyze the intelligence test given our subjects, the fact that our tests of higher mental functioning are approximations of items used on standard intelligence tests will provide a

measure of the accuracy of these assumptions. Where supplementary independent evidence is available we have included it as a means of testing their validity.

Undoubtedly, some aspects of intelligence are lacking in children who engage in making broad and sweeping generalizations about individuals or groups. A qualitatively different variety of intellectual factors would appear to be required to obtain, for example, conditional disagreements with the items on ethnic groups on the EAT. The results of our tests reported below would seem to lend weight to the view that the significant intellectual component lacking in children who are high in ethnic prejudice is an inability to regard unknown or strange objects or events in terms of their intrinsic qualities or values. The ethnically prejudiced child appears unable to deal effectively with problems that are equivocal in nature. If this fact were generally true of the thinking of children high in prejudice, then their susceptibility to learn and to manifest ethnic prejudices may be a function of an incapacity to view any outgroup without apprehension. Similarly, the ethnically prejudiced child may be incapable of viewing an ingroup as possessing any but virtuous traits.

While "intolerance of ambiguity" may or may not be a general personality characteristic of the prejudiced person, it is most certainly a distinct cognitional aspect of prejudiced behavior. Evidence from the California Study and the extensive studies of Rokeach would appear to support the view that the central intellectual component of the prejudiced as opposed to the unprejudiced child is the relative inflexibility of the prejudiced child's thinking. Hence, although general intellectual ability shows negligible differences between high and low ethnic prejudice, the intellectual factor designated by the term "mental rigidity" appears to be associated with high prejudice and a relative "mental flexibility" seems associated with low prejudice.

We turn now to the problem of the relationship of prejudice to the functions of some of the higher mental processes. Our question will be: Are there significantly different relationships between the patterns of performance on tests of various mental functions that distinguish children high from children low in ethnic prejudice?

PREFJUDICE AND INDUCTIVE REASONING

Concept formation or induction requires that specific objects or events be

so organized that a class of objects or events emerges. An individual may also hypothesize a concept, then test it on specimens from the class he assumes comprises the specimens. The former view of concept formation (or inductive reasoning as it is alternately known) is sometimes referred to as the "composite photograph" theory and the latter might be described as the "trial and check" theory, to adapt a phrase from Woodworth (60).

Concept formation in children has been regarded as a mental function that makes its appearance approximately between the ages of seven and eight.

Piaget's work with Swiss children (39) found in general that there are stages of development in reasoning. He maintained that reasoning below the age of 7 or 8 remains on the level of "syncretistic ego-centrism" and the child has great difficulty in making objective generalizations. Since his work, considerable evidence contradicting his position has appeared (6, 16, 18, 24, 28, 54).

Many theorists now hold that reasoning is a gradually emerging function that does not change by stages but rather by degrees. The seven-year-old child may be capable of handling simple concepts in a fashion similar to that employed by older children or adults. Moreover, a variety of reasoning "types" may be found at every age level. "Typical" reasoning presumed to characterize the thinking of young children concerning natural phenomena were found also at the adult level (37). Isaacs (24, p. 92) in her critique of Piaget sums up her work by pointing out that she found no evidence of mental "structures" that change in nature with age, but that

"... They show, rather, a continuous advance in scope and clarity of neotic synthesis and in the ability to handle experience in more and more complex form. The spontaneous behavior of these little children reveals the same continuity of growth as Burt's graded tests of reasoning have demonstrated in children from seven years of age onwards."

We tend to concur with the views of Isaacs and consequently have assumed that reasoning "ability" in our subjects will vary in degree rather than in kind.

With the foregoing assumption in

mind, we may define inductive reasoning as that process of thought in which the individual attempts to arrive at a general concept relating particular events or objects as members of a given class of events or objects.

To test this process of thought we used a group of eight Weigl-type objects (57) in a situation similar to that presented by the Wisconsin Card Sorting Test for Adults. These objects consisted of two groups: a "large" group of four objects measuring 5.5 square inches each, containing a red square, green circle, white triangle, and red triangle; a "small" group contained four objects of about 3 square inches. These were a blue triangle, a red square, a white circle, and a blue square.

Large Group

Red square ($2 \frac{11}{16}'' \times 2 \frac{11}{16}''$)
Green Circle ($1 \frac{15}{16}''$ diameter)
White triangle ($3 \frac{1}{2}''$ equilateral)
Red triangle ($3 \frac{1}{2}''$ equilateral)

Small Group

Blue triangle ($2 \frac{1}{8}''$ equilateral)
Red square ($1 \frac{1}{8}'' \times 1 \frac{1}{2}''$)
White Circle ($3 \frac{1}{4}''$ diameter)
Blue square ($1 \frac{1}{2}'' \times 1 \frac{1}{2}''$)

Consequently, the objects comprise four colors, three shapes, and two sizes. The objects were made of ordinary desk blotter cut to size.

Procedure

The subject was seated and the instructions given by *E* while he removed the objects from an envelope and scattered them on the table before *S*.

"Today we have a puzzle to do. Do you like puzzles? Good. Now, do you see all these different things on the table? Well, let's count them first and see how many there are. (*E* allows *S* to count the objects and assists him if necessary until *S* knows that there are eight objects.) Now here is what you have to do to get this puzzle. You must put these different things into groups, just like the groups in your class, so that the things that belong together go together in the same group. In each group must be the same number of things and only things that belong together must be in each group."

If the instructions were not understood, the *E* repeated them slowly and in a few cases *S* was urged to try to put the objects together (*E* employing some of the key words used in the instructions) as he began to deal with them.

The solution of the task set for *S* is to group the objects into one of two possible arrange-

ments: (a) Two groups, one of "large" and one of "small" objects; or (b) Four groups consisting of two "large" and two "small" subgroups. The subject, to be credited with a solution, was required to verbalize his solution—to make it plain that the size of the objects was the critical concept.

A maximum of 15 minutes was allowed for the procedure. Four hints were given the subject, if required, at intervals during the testing session. The exact point at which a hint was introduced varied from subject to subject depending upon the state of the *S*'s progress toward a solution. Typically, when *S* ceased concentrating on the problem or seemed at an impasse, a hint was offered.

If a hint was given and produced no renewed effort in *S* to go on with the task, the next hint was offered. The hints were as follows:

Hint 1: The large red square and large white triangle were placed apart from the rest of the objects and *S* was told, "To get this puzzle, this one and this one (pointing) must be in the same group. They belong together."

Hint 2: The first hint was placed before *S*. Then the small blue triangle and the small red square were placed apart from the rest of the objects and *S* was told, "To get this puzzle, this one and this one (pointing) must be together in the same group also. They belong together, too."

Hint 3: The two previous hints were placed before *S* and *E* picked up the small blue square and placed it in the "small" group, saying, "This one belongs in this group."

Hint 4: The *E* placed the three previous hints conspicuously before *S* and reminded him that these objects belonged together in the two groups as indicated above. The *E* then took the large green circle and placed it with the "large" group, saying, "This one belongs in this group; now what shall we do with the rest?"

With Hint 4, *S* had only two remaining objects: the small white circle and the large red triangle. If, after the fourth hint was given, *S* continued to remain in a quandary, *E* "tested the limits." The solution was presented to the *S* in a 4×4 grouping, and he was asked to tell why this grouping solved the puzzle. If this failed, *E* then made an individual comparison of one small with one large object, asking "How are these two the same" and "How are they different?" If *S* failed this, the test was discontinued. If *S* made the size comparison after this final procedure, the objects were then regrouped by *E* into a 4×4 size solution and *S* was asked, "How are all these the same" (pointing first to the small group, then to the large group). Finally *E* passed his hand over all of the objects in the large group and said, "How are all these different from all these" (pointing then to the small group).

One further hint was employed. If *S* was still unaware of the nature of the solution after three hints were given, an "arithmetic hint" was given. The *E* asked the subject to tell him how many and how many made 4. If *S* replied, "Two and two," *E* insisted again until a "three and one" response was forthcoming. Then *E* pointed to the Table and asked *S* to count the number of objects in each "hint" group and in the remaining group.

Results

Of the 58 subjects who took the concept formation test, 24 or 41.3% achieved "spontaneous" solutions. Such solutions on the average required about eight minutes of work and about two hints. Three subjects required no hints at all, 9 subjects required two hints, 1 required three hints, and the remaining 11 subjects required four hints.

Eighteen subjects failed to achieve any form of solution to the problem. This number represents 31.1% of the total group. All of these subjects were tested through the "testing-the-limits" procedure described above, each received the four standard hints and each was presented with the correct solution but could not comprehend its nature.

Sixteen subjects, or 27.6% of the group, achieved solutions that were either inaccurately verbalized or were based upon a concept other than size or were a consequence of the "guiding" procedure employed past the four regular hints. Hence we would prefer to call the solutions achieved by this latter group as "guided solutions."

Although only 40 subjects achieved some form of solution, 45 subjects or 77.6% of the group made at least some use of the concept of size at some point in their manipulation of the objects. A variety of solution and failure patterns of concept formation was found.

The use of shape seems to predominate in both the cases of subjects who solved and those

who failed to solve the problem. The pattern achieving the greatest number of solutions (shape, color, and size) and that achieving the second greatest number of solutions (shape and size) contains no reference to the use of "ideas." By *ideation*, we refer to the child's use of the geometric objects as elements in a design or "picture." For example, he would place several objects together and announce: "A tree with a trunk" or "a face with a hat." Ideational responses involved from two to all eight objects. Burt (9) and others have described the creation of designs in situations demanding attention to other, more abstract elements, as a more primitive type of response than attention to color or shape. In order of increasing abstractness, the determinants are: ideation, color, shape, and size. We shall consider each of these determinants in turn before analyzing the results in greater detail.

What we have called "ideation" would appear to be the natural play-tendency that must be temporarily suppressed while the child attends to the rules of the new "game." Design-building is the least abstract response to the situation simply because it is the most concrete in a situation demanding abstraction. Hanfmann and Kasanin (19) have similarly described a "personification" response tendency in schizophrenics as a primitivization of the thought process.

Color and shape are next in order of abstractness. Revesz (42) and Thompson (54) both have found color responses to be more typical of the very young children, while shape responses appear later in genetic sequence. In dealing with the objects both shape and color are potential "concepts." The individual may organize the objects into a variety of such concepts. The concepts thus derived are primarily a function of their stimulus character: shape and color are the most obvious surface characteristics. Shape and color concepts may here be referred to as "first order" concepts. They stem directly from the nature of the stimulus objects. The concept of size (the solution concept of this study) is a "second order" concept: the concept derives from the relationships between the objects. To achieve this second-order concept, the individual must (a) avoid design-building, (b) ignore the surface character of the object (shape and color) as irrelevant to the solution, and (c) note the differences between two sets of objects.

We now turn to the central problem of this chapter: Do the methods employed by more prejudiced children in reasoning inductively markedly differ from those employed by less prejudiced chil-

TABLE 7
ANALYSIS OF RESULTS OF CONCEPT FORMATION
TEST ACHIEVED BY GROUPS A AND B

	Group A		Group B		Total	
	N	%	N	%	N	%
Spontaneous solution	19	46.3	5	29.4	24	41.4
Guided solution	14	34.1	2	11.8	16	27.6
No solution	8	19.6	10	58.8	18	31.0
Total	41	100	17	100	58	100

dren? We have hypothesized that the methods differ in their "adequacy" in achieving a solution to the problem. One method of testing the adequacy of the methods employed by both groups is to determine whether or not solutions were, in fact, actually achieved. Obviously, arrival at the concept of size implies the employment of "adequate" methods.¹¹

In Table 7 three categories of "solution" are presented: Spontaneous solution, guided solution, and no solution. A spontaneous solution is a solution achieved through the individual's efforts aided only by the standard hints. A guided solution is a solution achieved by hints beyond the four standard hints in the course of "testing-the-limits." We do not mean to imply that the individual does not achieve a genuine understanding of the size principle as the "solution" but only that *S* received additional help and was guided to look for a concept other than those he had spontaneously employed. No solution resulted when the individual could not arrive at a solution despite all attempts at "guidance" by *E* in the "testing-the-limits" situation.

The ratio of spontaneous solutions comparing Groups A and B is 19/5 and is statistically significant. It should be noted that only 24 cases are involved. If

¹¹ Actually, this is not necessarily the case. Some subjects arrive at the solution in ways defying description. The solution simply appears, but the process of achieving it is not apparent to *E*, and it is a mystery to *S*, who is surprised to learn that the game is at an end.

we include the "guided" solutions with the spontaneous solutions, we find that the ratio of solutions to failures comparing groups A and B is, of course, also significant. Thus, it would appear that *more prejudiced children are less capable of arriving at the appropriate concept spontaneously and/or with additional aids from E*. As it might be expected, the number of no-solutions in the A group is significantly smaller than the number of no-solutions in Group B. Hence, there appears to be a marked inability among the more prejudiced children to arrive at the appropriate conclusion than among the less prejudiced children. Moreover, the ratio of 19 spontaneous solutions to 8 failures (for Group A) is significantly better (in terms of the task) than the ratio of 5 spontaneous solutions to 10 failures (for Group B).

We have partial proof that the ability to reason inductively is associated with a lack of ethnic prejudice and that inadequate inductive reasoning is associated with the presence of ethnic prejudice.

It may be argued that these findings do not demonstrate the relationship of conceptual difficulty among prejudiced children but do, in fact, indicate that the children in Group B are simply less intelligent than those in Group A. Similarly, a larger proportion of intelligent children may be found in Group A than in Group B. We may dismiss this argument at once, since we have shown that there is no significant difference in intelligence (as measured by IQ) between Groups A and B.

A more challenging case might be argued that those who passed the test (i.e., achieved a size solution) were more intelligent than those who failed. However, biserial r correlating intelligence and passing or failing is found to be .07,

indicating that intelligence, as such, is not the crucial factor in accounting for the differences between the two groups.

One approach to the qualitative analysis of our data is to determine "how close" the subjects who failed were to a final correct solution. Although 40 subjects passed this test, 45 subjects had made use of the concept of size at some point in their dealings with the objects. Closer inspection reveals that 4 of the 5 additional subjects using size are among the 8 in Group A who failed and 1 is from the no-solution subgroup of Group B. We may infer the adequacy or inadequacy of an approach to the objects in terms of their apparent relevance to the solution. We shall employ the term "hypothesis" to refer to the suggested uses offered by the subject in dealing with the objects. Some hypotheses are inferred from the subject's performance when no verbalization was forthcoming.

Comparing first the total number of "hypotheses" offered by the children in each group, disregarding whether or not a solution was reached, we find that there are 197 hypotheses in Group A with a mean of 5.05 ± 1.69 . There are 99 hypotheses offered by Group B; the mean numbers of hypotheses is 4.95 ± 1.44 . The difference between the two means is not significant. Do those who achieve solutions offer a greater number of hypotheses than those who fail? What is the relation of hypotheses in solution and no-solution groups in both the A and B groups? To answer these questions, we calculated the differences between the mean number of responses for each subgroup. Table 8 summarizes the findings.

We find that there are no differences between the number of hypotheses offered by less prejudiced children regardless of the outcome of their efforts. How-

TABLE 8
TESTS FOR THE DIFFERENCES BETWEEN MEANS OF SOLUTION AND NO-SOLUTION SUBJECTS
IN GROUPS A AND B

	Group A			Group B		
	Solution	No Solution	Total	Solution	No Solution	Total
<i>N</i> Hypotheses	154	43	197	31	68	99
Percentage	78.2	31.8	100	31.3	68.7	100
Mean Hypotheses	4.7	5.4		3.9	8.5	
Sigma	1.97	1.40		1.17	1.89	
<i>T</i>		1.13			5.75*	

* Significant beyond .01 level of confidence.

ever, a large and significant difference appears between the number of hypotheses of the more prejudiced group: no-solution subjects offer a great many more hypotheses than do subjects who reach a solution. What of the relationship of Group A solution to Group B solution and Group A no-solution to Group B no-solution?

We find a significantly greater number of hypotheses given by Group A-solution than by Group B-solution. But there are a significantly greater number of Group B-no-solution hypotheses than Group A-no-solution hypotheses. The above results suggest that (a) less prejudiced children take greater pains in achieving a solution by promulgating a greater number of hypotheses toward the correct solution when they achieve it; (b) More prejudiced children tend to attempt fewer guesses concerning the correct solution before they achieve it than do less prejudiced children; but (c) more prejudiced children who fail to arrive at a conclusion tend to offer a great many more hypotheses than either the less prejudiced solution or no-solution groups or the more prejudiced solution group. If the gross number of hypotheses is taken as an indication of the pertinence of the approach, it would appear that more prejudiced no-solution children develop

more adequate means for arriving at a solution despite the fact that they fail to do so. Why then do they fail? Below we offer an analysis of the number and type of inadequate hypotheses employed by each subgroup. Our criteria for inadequacy were:

1. "Personifies" the objects or makes a design of them.
2. An arbitrary concept is offered i.e., "The reds are really blue."
3. Repeats an hypothesis found lacking previously.
4. Attempts to make a jigsaw puzzle out of the objects.
5. Suggests altering the shape or color of objects.
6. Blindly matches the *E*'s hints with objects.
7. Assumes that there are too few or too many objects.
8. Random shifting of the objects occurs.
9. *S* accuses *E* of hiding objects or of trying to "trick" him.

From an objective point of view, these types of approach would seem unlikely to lead the *S* to a solution but rather would tend to lead him astray from the main task. It will be noted that not all of the items are "hypotheses," strictly speaking. We have used this term in a generic sense as also meaning "trial" or "attempt." In Table 9 we present the results of the analysis of inadequate hypotheses for each of the four subgroups.

At first we note that more than half

TABLE 9
TYPES OF INADEQUATE HYPOTHESES GIVEN ON CONCEPT FORMATION TEST

Hypotheses	Group A				Group B				Total	
	Solution		No Solution		Solution		No Solution		N	%
	N	%	N	%	N	%	N	%		
Designs	15	25.0	3	10.7	3	17.6	12	22.6	33	20.0
Arbitrary concepts	4	6.7	4	14.3	3	17.6	6	11.3	17	10.7
Color repetition	3	5.0	1	3.6	2	11.8	3	5.7	9	5.7
Shape repetition	26	43.3	14	50.0	2	11.8	20	37.7	62	39.2
Jig-saw fitting	4	6.7	1	3.6	1	5.9	3	5.7	9	5.7
Change, shape or color	3	5.0	2	7.1	2	11.8	1	1.9	8	5.1
Hint-matching	2	3.3	1	3.6	2	11.8	1	1.9	6	3.8
Assumes fewer or more objects	3	5.0	1	3.6	2	11.8	4	7.5	10	6.3
Random shifting	0	0.0	0	0.0	0	0.0	2	3.8	2	1.3
Accuses E of hiding objects	0	0.0	1	3.6	0	0.0	1	1.9	2	1.3
Total inadequate	60	100	28	100	17	100	53		158	100
Total responses	154		43		31		68		296	
Percentage inadequate		39.0		65.1		54.8		77.9		53.4
Total inadequate		88				70				
Percentage of total N responses		44.6				70.7				

of the 296 hypotheses offered by the total group of subjects are "inadequate" according to our definition. In the A group, there are 88 inadequate hypotheses or 44.6% of the total responses in Group A. Group B produced 70 inadequate responses of 99 offered, or 70.7% inadequate hypotheses. This difference is reliable. Hence, *more prejudiced children tend to produce more inadequate (or fewer adequate) hypotheses in attempting to arrive at a second-order concept than do less prejudiced children.*

We further find that the difference of 15.9% fewer inadequate hypotheses separating Group A-solution and Group B-solution is not significant although it is in the indicated direction. It is felt that the unreliability of this difference stems from the fact that there are 123 fewer responses among the B-solutions than among the A-solutions. This latter discrepancy may be traced to the small number of subjects in Group B who solved the problem (eight subjects) and the comparatively few hypotheses offered in their solutions (31 hypotheses). There

are other evidences of more adequate responses among the less prejudiced children: (a) the frequency of inadequate hypotheses in the B-no-solution group is significantly larger than that of the A-no-solution group. Hence, even in failing to solve the problem, less prejudiced children make "better" attempts toward its solution.¹² (b) In the two types of inadequate hypotheses occurring most frequently (designs and shape repetition), the A group suffers significantly fewer failures than does the B group, despite their occurrence. Apparently, designs and shape-repetition cannot be converted to advantage by the B group as it may be by the A group.

Bringing together the findings, we note that, although the mean number of hypotheses for Groups A and B do not differ:

1. The mean number of hypotheses of Group A-solution differs importantly

¹² As might be expected, the no-solution groups in each of Groups A and B make significantly more inadequate attempts to solve the problem than do their corresponding solution groups.

from the mean number of Group B-solution hypotheses. While the pertinence toward solution of the hypotheses offered by each group does not differ significantly, there are indications of qualitative differences in the types of hypotheses offered (as well as in the frequency of inadequate hypotheses in the B-solution group) in the direction of the solution in the more prejudiced group.

2. The greater frequency of inadequate hypotheses and the relatively small number of total hypotheses offered by the B-solution group suggests that more prejudiced children tend to "jump to conclusions" with fewer correct leads, even though a solution ensues. Less prejudiced children appear to take more guesses about the nature of the solution and these guesses seem to be more reality-bounded as well as less random.

3. Even when failing to arrive at the "solution" to the problem, less prejudiced children attempt fewer hypotheses, which are, however, more adequate to the achievement of a solution, than do more prejudiced children.

4. Where perseveration occurs, less prejudiced children appear to turn it to advantage (perhaps this fact would be more correctly interpreted as indicative of "stewing" or "mulling" among the less prejudiced children who finally come out with a solution). The more prejudiced children who appear to persevere fail to achieve a solution in the ratio of about 10/1.

On the basis of the above analysis we are now prepared to assert that hypothesis 1 has been substantiated by our findings: in situations requiring the formation of general concepts . . . more prejudiced children tend to be deficient in forming adequate concepts, less prejudiced children tend to develop adequate concepts.

PREJUDICE AND DEDUCTIVE REASONING

Most studies of reasoning do not, as a rule, specify what area of reasoning or of thought is to come under investigation. Rather, the reader is left to discover the types of reasoning studied from the context. Often, no attempt is made to distinguish between induction and deduction. As Woodworth has pointed out (60), induction and deduction are not necessarily different processes, but they do involve the manipulation of *different types* of material. Whether or not the processes involved in the solution of inductive and deductive problems are different would seem to be an empirical problem. No systematic attempts, however, have yet been made to establish the identity or uniqueness of these processes. There does seem to be an implicit assumption of difference in the two types of problem-solution in many intelligence tests for children.

Strictly deductive problems typically begin with the enunciation of a premise or set of premises. The individual is to "know" certain facts or to "grasp" certain relationships before the introduction of a question concerning "the next logical step" in consequence of the preceding steps. Sometimes, due to a desire to standardize the procedure and to eliminate extraneous associative factors, symbols are used in place of words in measuring or analyzing the reasoning of an individual. Hence, formal syllogistic logic has tended to become the medium through which this measurement or analysis has been carried out.¹³ The studies of Wilkins (59), Woodworth and Sells (61), Sells (50), Sells and Koob (51), and O'Connor (38), with adults as subjects, has taken the form of the solution of syllogistic problems. With children, Burt (9) employed syllogistic material in his "graded tests of reasoning" with great success. He considered these tests as the best single indicators of intelligence among older children. Although the items he employed are not strictly syllogistic,

¹³ It is not implied that deduction has been studied primarily through syllogistic logic. Rather we wish to point to the growing tendency to carry out empirical studies using syllogisms rather than other materials.

they have the general characteristics of the syllogism. Similar items appear in a variety of intelligence tests.

In the present study, we employed a series of items similar to those of Burt, but with certain changes introduced in the *form* of the items. The Deductive Reasoning Test (referred to hereafter as the DRT) is composed of nine items, an introductory item to familiarize *S* with the nature of the task, and eight test items. The final nine items selected were:

1. Electric lights never twinkle. This light is twinkling. Is it an electric light? Why?

2. It runs but it has no feet; it roars but it has no voice. What is it? Why?

3. Jane is taller than Jill. Mary is shorter than Jill. Who is the tallest of all?

4. You're going to the store. On the right-hand side is a farm, straight ahead is a lake. Which way is it to the store? Why?

5. The green bug runs faster than the red bug, the red bug runs faster than the blue bug. Which bug is slowest of all?

6. When it's hard you can throw it; when it's soft you can fall into it; you can swallow it, you can freeze it, and you can boil it. What is it? Why?

7. There are three babies. Johnny is older than Janie; David is younger than Janie. Which baby is the oldest of all?

8. Little boy A is short and fat. Little boy B is tall and thin. Little boy C is tall and fat. Which boy weighs the most?

9. If you touch it in the summertime it's cold. If you touch it in the wintertime, you may be burned. It's made of iron and it's sometimes painted silver. What is it? Why?

After *S* was seated he was instructed as follows:

"Today we're going to have riddles. Do you like riddles? Good. Now listen carefully to each riddle because I can only say them once. See if you can guess each riddle."

The problems were then presented in turn. The test took about 20 minutes per child to administer. Two types of problems were presented to the child: (a) problems that could be answered with only one correct response. These are problems of straightforward "formal logic" (items 3, 5, 7, and 8); (b) problems that could be answered correctly with any one of a number of possible responses ("ambiguous" problems including items 2, 4, 6, and 9). The items cover a wide range of difficulty and are of varied complexity. The ambiguous items were included to test subsidiary hypotheses suggested by the work of Frenkel-Brunswik (14) that prejudice is correlated with (a) an inability to cope with ambiguous stimuli in a flexible manner, and (b) the inability to take into account the multiplicity of potential responses. Rather, in a series of

TABLE 10
CORRECT, PREFERRED, AND INCORRECT
RESPONSES TO SEVEN ITEMS OF THE
DEDUCTIVE REASONING TEST

Items	Correct and Preferred		Incorrect		Total	
	N	%	N	%	N	%
2	31	58.5	22	41.5	53	100
3	49	86.0	8	14.0	57	100
5	48	82.7	10	17.3	58	100
6	67	81.7	15	18.3	82	100
7	30	64.3	20	35.7	56	100
8	23	40.4	34	59.6	57	100
9	19	33.3	38	66.7	57	100
Totals	273	65.0	147	35.0	420	100

studies on memory and perception, Frenkel-Brunswik and her co-workers found that more prejudiced persons tended to select one of the potential responses and to cling to it tenaciously in spite of the changing stimulus field.

As used in this study, deductive reasoning is defined as that process of thought in which implications are drawn from given premises. Based upon this definition, the results have been analyzed in a number of different ways. A total of 473 positive responses were obtained in answer to the 8 test problems, an average of 58.6 responses to each problem. Responses were obtained from 57 of our 60 subjects (40 in the less prejudiced group and 17 from the more prejudiced children). Table 10 presents a summary of correct and incorrect responses to both formal logic and ambiguous questions. One may question whether there can be a "correct" response to an ambiguous question. However, the ambiguous items are so worded that a "preferred" response might be given. In the case of item 4, none of the three obvious alternatives need necessarily be "correct." All are potentially acceptable if the reasons offered as support for choosing one of them are adequate. Hence, the "correct" responses to the ambiguous items are in reality only *preferred* (most pertinent to the premises) responses. The results for item 4 are presented separately below in a more extended analysis.

Two-thirds of all the responses, regardless of type of item, are correct or preferred. Some items are obviously more difficult than others. The "easy" items would appear to be items 3, 5, 6, and 7. Only a third of the responses to item 9 are correct; item 8 was correctly re-

TABLE 11
RESPONSES TO DRT ANALYZED INTO
FORMAL-LOGIC AND AMBIGUOUS
CATEGORIES

	Ambiguous		Formal logic		Totals	
	N	%	N	%	N	%
Correct (preferred)	117	60.9	156	68.4	273	65.0
Incorrect (nonpreferred)	75	39.1	72	31.6	147	35.0
Totals	192	100	228	100	420	100

sponded to in 40% of the cases.¹⁴ Item 2 is correctly responded to in 63% of the cases.

Analyzed into ambiguous and formal logic categories the questions are responded to in the following fashion:

Chi square¹⁵ for the differences in type of responses to the two types of problems is not significant at 2.71. The ratio of ambiguous to formal logic correct responses indicates that in general the more ambiguous problems are more difficult than are the formal logic problems.

To return for a moment to item 4, we find that of the 53 responses to this problem, 25 or 47.2% are responded to in terms of the "atmosphere" of the problem (the store is said to be to the left). The remaining 28 responses or 52.8% are distributed between responses of "to the right" or the "farm-way" and "straight ahead" or the "lake-way." None of these responses may be considered incorrect, although the rationale for choos-

¹⁴ It should be noted that item 8 is more ambiguous than was intended. A good many children saw no reason why a short, fat boy should weigh less than a tall fat boy. Nevertheless, a substantial number asserted the relation of height and girth to weight in the intended fashion.

¹⁵ This analysis is based upon one response per subject for the most part, hence chi square is employed.

ing one of them varies greatly in acceptable reasoning from subject to subject. The reply "to the left" may be based on the subject's understanding that the farm and the lake stand as *barriers* or as illogical places to have a store. Some subjects derived the response from "pure logic": left was the only *forward* direction not mentioned in the problem. Many subjects felt as did one that: "it could be anywhere." Here, the reasoning was that the premises did not necessarily limit the location of the store to any particular place in any particular direction. One subject replied: "It might be behind you or it might be in town, wherever the town is." An incorrect (nonpreferred) response is the following: "It's straight ahead." (Why?) "The store is in the lake 'cause the lake has no water in it." Considering the ambiguity of the problem, the store might conceivably be in the lake if it were dry, although reality demands that we label this reasoning as "inadequate." We shall come back to the problem of item 4 at a later point in the analysis.

We now are prepared to test the hypothesis that "more prejudiced children tend to produce more numerous as well as more invalid conclusions than do less prejudiced children."

A cursory examination of the results summarized in Table 12 indicates that at least the first part of the hypothesis (that dealing with the number of conclusions) is not verified. Although all subjects did not give usable responses to each problem, we find that the mean number of responses given by the Group A for seven items is slightly more than 1.0 per subject and for Group B the mean is 1.13 per subject. The difference is insignificant. The fact that S gave only one response to each question (item 6 is a notable exception) may be in part due

TABLE 12

NUMBER AND TYPE OF RESPONSE TO
DEDUCTIVE REASONING TEST BY MORE
AND LESS PREJUDICED CHILDREN

Item	Type of Response ^a				Totals	
	Group A		Group B			
	Cor- rect	Incor- rect	Cor- rect	Incor- rect		
2 ^b	23	8	8	14	53	
3	36	4	13	4	57	
5	32	9	16	1	58	
6 ^b	47	5	20	10	82	
7	24	15	12	5	56	
8	14	26	9	8	57	
9 ^b	16	23	3	15	57	
4	16	24	9	4	53	
Totals not including Item 4	192	90	81	57	420	

^a Don't Know responses are not included in this table, since we wish to consider here only positive responses to the problems. We shall consider the meaning of Don't Know responses at a later point.

^b Ambiguous problems.

to the nature of the problems. In those involving linear relationships of increasing size or age, little speculation is possible. The ambiguous problems offer a wider range of possible answers. Hence, speculation would appear more frequently. However, the more prejudiced children are not more speculative than the less prejudiced children in response to either the formal logic or the ambiguous problems.

The latter part of the hypothesis we are to test deals with the validity of the conclusions reached by S. We first compared the correct (preferred) and incorrect (nonpreferred) responses of all subjects to seven items of the DRT (again omitting item 4) and found the differences between Group A and B to be not significant. Hence, correctness or incorrectness of the responses as a whole shows no tendency to differentiate prejudiced from unprejudiced children.

TABLE 13

PREFERRED AND NONPREFERRED RESPONSES ON
AMBIGUOUS PROBLEMS BY MORE AND LESS
PREJUDICED CHILDREN

Type of Response	Group A		Group B		Total
	N	%	N	%	
Preferred	86	70.5	31	44.3	117 60.9
Nonpreferred	36	29.5	39	55.7	75 39.1
Total	122	100	70	100	192 100

We next compared the results of the two prejudice groups against the two types of problems. Chi square for the formal logic problems is 1.10 and is insignificant. Chi square for the ambiguous problems is, however, 11.39 and is significant beyond .001 level of confidence. (Table 13) Even if item 4 is included in the computation of the results and the "left side" response is taken as correct, p is still at the .02 level of probability. It appears that the accuracy of deduction is dependent upon the nature of the problem to be solved: the more prejudiced children having much more difficulty in arriving at valid conclusions on problems involving some ambiguity than do less prejudiced children. Both groups, on the other hand, have equal success (or difficulty) on problems of formal logic.

Group A, on both types of problems, succeeds on two problems for every one that it fails. In Group B, on the other hand, the ratio of correct to incorrect on formal logic problems is about 3/1, but on the ambiguous problems the ratio is about 1/1 leaning in the direction of more nonpreferred responses.¹⁰ These dramatic differences would seem to confirm Frenkel-Brunswik's "intolerance of ambiguity" hypothesis: The prejudiced

¹⁰ Statistically, chi square for the differences in success in Group A for each type of problem is .62 and p is $< .50$. The comparable chi square for Group B is 31.65 and p is beyond the .001 level.

children in our study are far less capable of dealing in logical fashion with ambiguous problems than they are capable of succeeding with clear-cut formalistic problems. These findings are consistent with those of O'Connor (38), who studied the relationship of abstract reasoning ability to ethnocentrism, ethnic prejudice, and intolerance of ambiguity in 77 Harvard undergraduates. She found ethnocentrism related to difficulty in abstract reasoning when intelligence was controlled. Further, intolerance of ambiguity was related to poor abstract ability *only* when associated with ethnocentrism. In view of the argument to follow, we would interpret O'Connor's findings to mean that all three factors are related to some unknown prime causative factors. These factors produce the prejudiced approach to life in both the world of objects as well as social relations.

An important factor in the differences obtained are the comparatively large number of nonpreferred responses of Group B. In order to determine the nature of these responses and their comparative likenesses and differences between more and less prejudiced children, we undertook an item analysis of the responses to ambiguous problems. Before presenting the results of that analysis, we should like to return to the formal logic problem for a moment.

One may ask, "What is the nature of the task for *S* in the so-called formal logic problems?" The *S* is required to compare two sets of functions (a is older than b; b is younger than c) and then to derive the logical relationships holding between both sets of ages of a, b, and c. Only one sequence is possible: there is only one correct deduction to be made. Moreover, the correct response is present as part of the statement of the problem. This sort

of problem is not difficult for young children. Nearly 75% of Burt's subjects (9) who passed such items (his *Ss* ranged from 5 to 12 years) and 80% of *Ss* in the present investigation found little trouble in selecting the correct response.

The ambiguous items pose a different kind of problem to the child. There is no simple choice to be made. The *S* must select the one reply that most closely fits the premises. His response must reside in his ability to understand. Moreover, as in items 2, 5, and 10, the "something" that the *S* must deduce has certain qualities which seem to be anachronistic or self-contradictory. In item 10, for instance, the child searches for an object whose thermal characteristics are inversely related to the outside temperature. In item 6, he is asked to deduce something that seems capable of changing like the proverbial chameleon. In item 2 he must find something that behaves in animate fashion but does not possess animate attributes to account for this behavior. Hence, these problems are more complicated and more baffling to young children, to judge by our results. But of special interest is the fact that less prejudiced children have reliably less difficulty in dealing with these ambiguous problems than do more prejudiced children. To analyze this finding in detail we examined the nature of the responses to two of the ambiguous problems.

We have raised the problem presented by item 4 and discussed some of the general results obtained. Three types of responses are made to this problem.

A further analysis of each type of response reveals that those *Ss* who choose "left" as their conclusion in almost every case create what amounts to a formal logic problem of this item. The reasoning is somewhat as follows: "To the right

TABLE 14
RESPONSES TO ITEM OF DRT BY
GROUPS A AND B

Response	Group A		Group B		Total	
	N	%	N	%	N	%
Left	16	40.0	10	58.8	26	45.6
Farm-way	16	40.0	4	23.5	20	35.1
Lake-way	7	17.5	1	5.9	8	14.0
Other	1	2.5	2	11.8	3	5.3
Total	40	100	17	100	57	100

is a farm, so there is no store *there*. Straight ahead is a lake so there is no store *there*. Therefore, there is only one place for the store to be and that is to the left." Hence, the lake-way and the farm-way are "blocked" or "occupied." The "unblocked" or "unoccupied" side is chosen as the only alternative. For these children, this is not a choice but an elimination problem, having the elements of formal logic problems. The solution of the "riddle" resolves into the following syllogistic format: given A, B and C; it is not A and not B, it must, therefore, be C. Some examples of this reasoning follow:

"Left. 'Cause you didn't say left."

"The left is the store, 'cause it can't be in the farm or up by the lake."

"Left. There is nothing else." (Must it be on the left?) "Yes, the lake is in front and the farm is right."

"Left. 'Cause farm's on the right, lake ahead. Store left."

"The left-hand side. You left out left, the others have something."

Those who choose the lake-way or the farm-way are not restricted by the "logic of the situation." Rather they view the problem as an indefinite one. For some, the farm is not an impediment and for others the lake is not a barrier. The locations of the lake and the farm do not necessarily determine the location of the store. Some typical examples are:

"Right hand. Oh, I meant straight ahead." (Why?) "Cause it could be near the lake." (Must it be near the lake?) "No, could be near the farm if the farm and the lake are near one another."

"Towards the lake. You can't buy things at the lake—you can buy things near the lake."

"Near the farm. 'Cause farms are near stores and lakes are further."

"To the barn (farm). In a lake you can't buy food." (Is store in the farm?) "Could be or could be on the other side of the farm."

"Might be lake-way. Might be in the park or somewhere. You can walk past the pond and the store would be a little bit further on."

Since the location of the store is ambiguous to these children, room is left for imagining where a store might or could be. The child calls upon experience and imagination to fill the gap left by the ambiguity of the problem. It is important to note that the formal logic solutions do not permit alternatives. It must be "to the left" because "nothing is left" to choose. Thus when asked, "Could it be somewhere else?" none of the formal logic children reply affirmatively. On the other hand, 14 or 50% of Ss giving other-than-left responses admit the possibility of the store's being in a number of different places. Since all of the children were asked to state whether the store could be located elsewhere, the above figure indicates at least the minimum number admitting the possibility of an alternate locale.

Examining the responses of Group A and B according to the types of reasoning involved in reaching a conclusion (eliminating uncertain and erroneous responses) we find that there are a significantly larger number of non-formal-logic reasons given for Group A than for Group B responses. Table 15 summarizes these findings.

Hence, less prejudiced children tend to allow a degree of flexibility in their interpretation and response to item 4 while more prejudiced children tend to

TABLE 15
REASONS OFFERED TO EXPLAIN CONCLUSION
DRAWN IN ITEM 4 OF DRT BY
GROUPS A AND B

Reasons	Group A		Group B		Total	
	N	%	N	%	N	%
Formal	14	37.8	10	71.4	24	47.1
Nonformal	23	62.2	4	28.6	27	52.9
Total	37	100	14	100	51	100

interpret the problem in a somewhat rigid manner and respond to it in formalistic terms.

Item 6 of the DRT concerns a subject having six qualities. The *S* is required to keep in mind its different properties. Six response categories were employed in analyzing the data: water, food, ice or snow, mud or sand, an object, don't know.

What is a *valid* conclusion to be drawn from this problem? The subject of the problem has plasticity, since it can exist in both a hard and soft state, it can be ingested and is capable of being subjected to extreme temperature changes. Perhaps its key property is its capacity for being swallowed. This suggests a food of some sort. We do not generally fall into food, however, although this is entirely possible in the reasoning of small children, to judge by the results. We can both fall into snow and swallow it but we generally do not boil it. Snow is made

of water, water is capable of fulfilling our premises most completely. Hence, water would be our most valid conclusion and such responses as snow or ice and some sort of food would be among the preferred responses. This problem involves drawing implications from a set of premises about *something* rather than *someone*. The premises must be related by eliminating assumptions violating any one of the six properties ascribed to the subject.

The preferred responses occur systematically more frequently in Group A than in Group B. The nonpreferred responses (mud or sand and objects) reverse this trend, Group B producing twice as many nonpreferred responses as does Group A.

It is valuable to determine the number of subjects in each group offering divided or furcated responses. Such an analysis is made in Table 16. We note the significantly greater number of *Ss* in Group B who produce furcated responses. Furcation has the net effect of leading the *S* away from his central task: the employment of all of the information given him. Hence, the preponderance of nonpreferred responses occurs in Group B. Twelve of the fifteen participating *Ss* in Group B produced one of the more preferred responses, six of these being the most adequate response: water. In the A group, all but three *Ss* produced at least one of the preferred conclusions. The problem was apparently a comparatively simple one for most of the *Ss*.

A final qualitative finding is of special interest to this study. We examined the response sequences to item 6 for each group to attempt to reconstruct the reasoning that led to the particular conclusion offered by the child. A striking difference was found between the sequence given by members of Group A and that

TABLE 16
ANALYSIS OF CONCEPTUAL AND FURCATED
TYPES OF RESPONSE TO ITEM 6 OF DRT

Response	Group A		Group B		Total	
	N	%	N	%	N	%
Conceptual	31	83.8	7	46.7	38	73.1
Furcated	2	5.4	6	40.0	8	15.4
Don't Know	4	10.8	2	13.3	6	11.5
Total	37	100	15	100	52	100

by members of Group B: 8 of the 15 children in Group B divided their responses into segments, each segment fulfilling one of the six qualities mentioned in the statement of the problem; only 2 of the 37 Ss in Group A demonstrate such segmentation. An example of this reasoning follows:

F3: "Maybe a food you can eat. A deep freeze is so heavy. The soft is some orange juice, the hard is a deep freeze. A finger you can't cut off because it is a bone. A ball is hard you can throw it. A sandwich you can eat and freeze and jump into."

S10: "Mud you can slop in it, and the other one is a ball, it's hard. Water you can turn into ice, slip in it."

Typically, not all of the six qualities are mentioned. S asks himself: "What is hard?" and "What can I fall into?" and "What can you boil?" It seems as if the subject cannot conceive of something with multiple attributes or is trying to start an association beginning with one determinant (i.e., such as hardness or swallowability). The process of furcation described above differentiates between the A and B groups beyond the .01 level of probability.

Evaluating the evidence presented in this chapter, we conclude that in situations requiring deductive reasoning, more prejudiced children tend to produce no more numerous but more invalid conclusions than do less prejudiced children. The sheer number of responses does not differentiate Group A from Group B as it did in our test of inductive reasoning. Moreover, if all Ss' responses are pooled and the two groups are compared for the frequency of valid and invalid conclusions, again there is no statistically significant difference. We may divide all the problems into two types: those that are syllogistic and those that are nonsyllogistic in form. We find no differences between Group A and Group

B responses to the syllogistic problems. Prejudiced children, however, have much more difficulty in arriving at valid conclusions when the problem and/or its conclusion is not in syllogistic form. Unprejudiced children have significantly less difficulty. Prejudiced children, when they do arrive at a valid conclusion, do not generally tend to "see" the conclusion at once but apparently require one or two "trial balloons" before reaching it. A statistically greater number of the unprejudiced children arrive at the correct conclusion at once, satisfying the restrictions of the premises. Prejudiced children tend to *furcate* the ambiguous problems far more than do unprejudiced children. Furcation tends to concretize and simplify the problem, essentially transforming it into a problem of "formal logic." Similarly, more prejudiced children tend to convert ambiguous problems into unidirectional problems (i.e., as in item 4). Unprejudiced children engage in furcation and conversions of the sort described far less frequently.

Finally, prejudiced children tend not to admit a lack of knowledge but persist in offering hypotheses, even when they are challenged by E concerning their validity. Over-all, there are .52 "Don't Know" or "I give up" responses in Group A, an average of about 1.3 such responses per S to the 8 test items of the DRT. In Group B there are 10 "Don't Know" or "I give up" responses or .56 responses per S. This difference between Groups A and B on the tendency to admit lack of knowledge or an inability to reach a solution is significant beyond the .01 level of confidence. It would appear, then, that prejudiced children are not only less capable of producing valid conclusions but the invalid ones they do produce are *dogmatically held*. Another way of interpreting this result is that

prejudiced children tend not to admit what, to *E*, might be seen as an admission of weakness. The validity of this hypothesis would seem to receive support from the "anti-weakness" tendencies of the ethnically prejudiced found in the *California Study* (1). (See also 47, 48, and 49.)

PREJUDICE AND PROBLEM SOLUTION

Rokeach (44), in a brilliant research carried out as part of the California Study, demonstrated the existence of a "generalized mental rigidity" in ethnocentric adults. He found similar results in the part of his research dealing with late childhood and adolescence (the median age of his group was 13 years). Since this latter aspect of his work is of immediate importance to the present study, we shall report it in detail.

Rokeach administered the California Ethnocentrism Scale I to 193 subjects and followed this with a test of mental set: the subject was asked to solve a series of arithmetic problems involving the use of three hypothetical jugs of given capacity. Set was established if *S*, after solving three problems by a long and devious method employing all three jugs, continued to employ this "less adaptive" technique over a group of "critical" problems (five in number) in which the problem was capable of being solved by a short, direct method as well as by the long, indirect method. Only subjects falling into the set and who had solved control problems by the short method were considered in the final analysis of the results. Of the original 193 subjects, 75 comprised the final group which was divided into those High and those Low in ethnocentrism as measured by the California Scale. Rokeach found that the High children gave a greater proportion of "rigid" solutions (i.e., using the long method) than did the Low children on all of the 10 critical problems employed. Statistical significance differentiating the two groups was found on 4 of the 10 problems. Analyzing the amount of scratch paper used by each group as a measure of rigidity (Rokeach sees the scratch paper as a "mental crutch," unnecessary when *S* uses the short method), it was found that the High group used more scratch paper than did the Low group in 12 of the 13 problems. The differences between the

two groups were found to be significant on only one problem, however. Rokeach concludes that those who are rigid on tests of social attitudes (ethnocentrism in this case) are also rigid in solving nonsocial problems.

Both clinical and experimental studies (43, 53, 58) have tended to establish the general nature of rigidity: the tendency to fixate responses, to engage in stereotyped modes of behavior and thought, to persevere ideationally, and to think and behave in concrete as opposed to abstract ways. Rigidity in the present research is taken to mean the inability to solve conceptual problems due to the perseveration of a previously established mental set, no longer adequate to their solution. If, indeed, prejudice may be thought of as a form of perseveration either of thought or behavior or both, and if perseveration is a general factor of personality organization, then it should be found in cognitional processes as well (10).

It may be argued that children do not possess deep-seated prejudices: that, in fact, children at this age do not exhibit rigidities in any systematic fashion. Our findings concerning the prejudiced seven-year-old child's ability to think and reason logically would not tend to support this view. Rather, it would appear that more prejudiced young children do exhibit a narrowing of mental capacities appearing in the form of simplification, furcation, and concretization in solving various types of problems requiring different modes of approach.

In this chapter we are concerned with the ability of *Ss* to solve certain conceptual problems involving the establishment and breaking of induced mental sets. While mental sets are not to be regarded necessarily as detrimental to adequate problem solving, in the present instance they were especially arranged so as to have this effect. Our problem stems from a common observation: that the dogmatically prejudiced person tends to be "narrow-minded,"¹⁷ unamenable to persuasive argument. We may say that his

¹⁷ Rokeach has extensively explored this concept (see 45, 46).

views appear to be unusually fixed or set and unusually resistant to change. One may therefore argue that prejudice is significantly associated with the general characteristic of inflexible mental sets: that mental sets are to be found among highly prejudiced persons while this is less likely to be the case with individuals showing little prejudice. Stated formally, we shall attempt to test two hypotheses, each with two subparts: (a) more prejudiced children tend (i) to establish *inefficient* mental sets, and (ii) to employ inappropriate methods to break them; and (b) less prejudiced children tend (i) not to establish *inefficient* mental sets, and (ii) to employ appropriate methods to break them when they are established.

Our procedure was designed to have *S* search for a concept that would allow him to predict the location, the position, and the sequential movement of an object hidden among a group of similar objects. Four separate subtests comprise the total test: a location test, a position test, a movement test and a reverse-movement test.

The materials employed were a group of three white, flat, push-drawer pillboxes measuring $2\frac{1}{2} \times 1\frac{1}{2} \times \frac{5}{8}$ inches. The boxes were of uniform appearance and were presented to *S* with seams facing the same direction. Since standard pillboxes were employed they were easily replaced as soon as they became worn or defaced. The *S* was seated and *E* began:

"Today we have a guessing game. Do you like guessing games? Good. Now listen very carefully. Do you see those three boxes?" (*E* places the boxes in front of *S* and points to each in turn). "You see, here are three boxes that are all alike. But, on the back of each box there are little dots. See, this one has 2 dots, this one has 3 dots and this one has 4 dots. Now here's how we play this game. I'll mix the boxes while you hide your eyes and then you guess where one of the boxes is. We'll look for the same box until we find it 5 times in a row. If you guess right I'll say 'Right' and show you the bottom of the box. If you guess wrong, I'll say 'Wrong' and show you the right box. I'll never try to fool you, but I'll show you the right box each time. Each time you guess there will be a trick to the puzzle. If you guess the trick, you'll know where the right box is. All right, do you understand the game?" (If *S* indicates understanding, *E* proceeds to the trial

test. If *S* is uncertain or does not understand *E* re-explains the procedure and rules until *S* indicates understanding. In several instances the trial test was held to familiarize *S* with the procedure. As a result, no *S* was eliminated from the testing because of lack of comprehension of the nature of the "game.") "All right, now hide your eyes until I tell you to look."

A trial test was held to prepare *S* for the actual testing procedure. The three boxes were laid before *S* in a vertical-horizontal-vertical sequence. He was told to "look for box No. 2" (with 2 dots on the bottom). The correct box was kept in the horizontal position. The *E* permitted *S* to "guess" the correct box until he made 3 consecutive correct choices and verbalized the solution. The verbalization consisted in *S* noting that box No. 2 remained in the same relative position even though its location changed from trial to trial. (*E* explicitly pointed out that the "trick" was horizontally. The other two boxes were kept in the vertical position). If *S* did not correctly identify the sought-after box within 10 trials, *E* described the solution for him. The *S* was then presented with a second test trial with a horizontal-vertical-horizontal (H-V-H) sequence and the same procedure was followed as with the first test trial. No subject failed the second test trial. The *E* immediately proceeded to main variations of the test.

Test 1 was a *location* test. The *E* was presented with a Left Oblique-Vertical-Horizontal Pattern. The key box changed position randomly to vertical, horizontal, and oblique, but remained as the left-hand box (facing *E*, right-hand facing *S*; locations are given with the *E* as point of reference throughout this test). *The S was allowed 25 trials to locate the correct box. Five successive correct trials and the verbalization of the principle were the criteria of success.* If *S* reached the 21st trial without a chance of reaching the criterion of sequential successful trials, the test was discontinued. Successful completion of Test 1 was prerequisite to being considered in the analysis of results, since this test served as the "set-inducing" stimulus. Nevertheless, for the sake of uniformity all subjects were administered all four subtests (with certain exceptions noted below). If *S* verbalized the principle before the 5 successive correct trials, the solution was considered achieved. Usually, if *S* achieved a solution within the first 5 trials, *E* would press *S* to go on with the test in order to determine whether the "solution" allowed prediction to further successful trials.

Test 2 consisted of a *position* test. The correct position was the Oblique with the *S* again being required to choose between vertical, horizontal, and oblique position. In this case the *location* of the objects was changed randomly at each

trial. The same criteria used in Test 1 for success were also employed on Test 2. On this test and the two succeeding tests the *E* recorded the *S*'s choices, and all remarks made by *S* verbatim, on a specially prepared scoring sheet. The sheet was arranged in the form of a contingency table with the random locations and positions marked across the X-axis and *S*'s selections marked along the Y-axis. For Test 1, locations were marked along the Y-axis and positions marked along the X-axis.

Test 3 was a *movement* test. The boxes were presented to *S* in a V-V-V sequence. The correct box was located at the *left-hand side* at the start of the test and was shifted successively to middle, then right, then left, middle, right, left, etc. until the criterion was reached or *S* failed.

Test 4 was a *reverse-movement* test. The boxes were arranged again in a V-V-V pattern with the correct box being placed on the *right-hand side* and shifted successively to middle, left, right, middle, left, right, etc., until the criterion was reached or *S* failed.

The results are based upon 53 *Ss*, 38 (72%) of whom are in Group A, and 15 (28%) of whom are in Group B. These figures are only slightly different than the ratio of 70%/30% for the entire group.

We assumed that most *Ss* would pass Test 1 since it consists of a simple localization problem. Only three *Ss* failed Test 1 and they were dropped from the analysis of the results. Hence, 53 *Ss* passed Test 1. We further assumed that Test 1 would serve as a set-establishing problem: *S* would be set for location-solutions when Test 2, requiring the subject to drop the first set and seek for a position-solution, was administered. If no set was established by Test 1, *S* would have little trouble in arriving at the solution of Test 2. As shown in Table 17, 32 of the 53 *Ss* failed Test 2 (60.4% of the group).

Test 3 offered *S* an opportunity to break the original set, if it had been established, since it removes one of the characteristics of the two previous patterns: all boxes are presented in a V-V-V pattern. The subject does not have to be concerned with the position of the boxes. Moreover, since Test 3 is essentially a

TABLE 17
SUCCESS AND FAILURE FOR TOTAL GROUP
ON TESTS 1-4: PROBLEM-SOLVING

Test	Pass		Fail		Total	
	N	%	N	%	N	%
1	53	100	0	0.0	53	100
2	21	39.6	32	60.4	53	100
3	39	73.6	14	26.4	53	100
4	27	50.9	26	49.1	53	100
Totals	140	66.0	72	34.0	212	100

location problem, the *S* can draw upon his skill and success in achieving a solution on Test 1 in attempting to solve Test 3. We note in Table 17 that only 14 *Ss* failed Test 3 (26.4% of the total group).

Test 4 was given to determine whether or not the original set was still operating in those *Ss* who failed it and to assess the effect of Test 3 as a set-inducing stimulus for those *Ss* who passed it. Again we see that 26 *Ss* failed Test 4 (49.6% of the group).

How many tests were passed and failed by our two groups? Do prejudiced children establish inappropriate perseverative mental sets in greater number than do unprejudiced children? We analyzed the frequency of failures for each subtest according to prejudice groups. Table 18 summarizes our findings. Of 152 individual tests taken by Group A, 113 (74.3%) were passed and 39 (25.7%) were failed. Of the 60 individual tests taken by Group B, 27 (45.0%) were passed and 33 (55.0%) were failed. This difference is reliable: Chi square is 16.43 and *p* is < .001. If we eliminate Test 1 data from the results (since all *Ss* passed Test 1) the differences are still great: Chi square is 19.75 and *p* is < .001.

We conclude that the more prejudiced children are less able to solve our critical problems than are the less prejudiced

TABLE 18
SUCCESSES AND FAILURES OF GROUPS A AND B ON TESTS 1-4: PROBLEM SOLVING

Test	Group A				Group B				Total	
	Pass		Fail		Pass		Fail			
	N	%	N	%	N	%	N	%		
1	38	100	0	0.0	15	100	0	0.0	53	
2	18	47.3	20	52.7	3	20	12	80.0	53	
3	32	84.2	6	15.8	7	46.7	8	53.3	53	
4	25	65.8	13	34.2	2	13.3	13	86.7	53	
Totals	113	74.3	39	25.7	27	45.0	33	55.0	213	

children. We find (Table 18) that the ratio passing to failing of Groups A and B on Test 2 is not statistically different. We note that while 53% of the Ss in Group A failed Test 2, 80% in Group B failed it. Similar ratios between groups A and B on Test 3 are significant at the .02 level. For Test 4 the comparable p is $< .001$. Hence, there are increasingly significant differences between the pass-to-fail ratio of Group A as compared to that of Group B.

We turn our attention now to the pattern of successes and failures in each group. Which tests were passed and failed in sequence by our two groups of subjects? We find that 15 Ss passed all 4 tests and all but one are in Group A. Of the 14 Ss who passed 3 of the 4 tests, 13 are in Group A and 1 is in Group B.

Hence 26 of 28 Ss passing at least 3 tests are in Group A. Seven members of each group passed only 2 tests and 4 members of Group A compared to 6 members of Group B passed only one test. This data is summarized in Table 19.

If we note the number of Ss in each group who, having failed Test 2, went on to fail Tests 3 and 4, we find that Group A differs from Group B in this regard with significantly greater frequency of failure in Group B. Thus, while only some members of Group A failed on Test 2, about the same number went on to fail the other tests as well. However, in Group B, children who failed Test 2 generally failed either or both the remaining tests.

If we take the frequency of failure to solve more than one of the "critical" tests

TABLE 19
PATTERNS OF SUCCESSES AND FAILURES ON TESTS 1-4: PROBLEM-SOLVING

Tests	Group A		Group B		Total	
	N	%	N	%	N	%
1 2 3 4						
• * * *	14	36.0	1	6.7	15	28.3
• X * *	11	28.8	1	6.7	12	22.6
• * * X	2	5.3	0	0.0	2	3.8
• * X X	2	5.3	1	6.7	3	5.7
• X * X	5	13.2	6	40.0	11	20.8
• X X X	4	10.5	6	40.0	10	18.8
Totals	38	100	15	100	53	100

Legend: * Pass
X Fail

(i.e., Tests 2, 3, and 4) we find that Group A passes 27 and fails 11 tests, while Group B passes 2 and fails 13 tests, and this difference is reliable. It seems clear that the more prejudiced children fail a good many more tests than do the less prejudiced children. From Table 19 we find that 47% of the Ss in Group B fail two "critical" tests, while an additional 40% fail all three such tests. Comparable percentages for Group A find only 18.6% failing two tests and 5.5% failing all three.

Twenty-four Ss failed two or three tests. Of this group only 3 passed the first 2 tests and failed Tests 3 and 4. The remaining 21 Ss failed either Test 2 and 4 or Tests 2, 3, and 4.

We now turn to our central problem—do prejudiced children, in fact, tend to establish perseverative mental sets in greater number than do unprejudiced children? Our task was to compare the frequency of success on each of Tests 2, 3, and 4 and the frequency of failure due specifically to a perseverative mental set for each group. We first set up a group of criterion categories to establish which responses could be attributed to set and which responses accrued in consequence of other factors. Our general procedure was to analyze the sequence of "guesses" made by each S who failed Tests 2, 3, or 4. In Test 2, for example, we wanted to know what procedures S followed, how systematic he was, and whether he attempted to set up "hypotheses" concerning the nature of the "principle" that would lead to success. Test 2 involved a position set (the oblique box is the correct object). Did the S persist in searching for a correct location, the principle of which had led to success on the first test? How random are the failing Ss attempts to solve the problem and "get the trick?" In brief, how and why did the

S fail? The criterion categories established were as follows:

1. *"Location-set."* Three categories (S selects either left, middle, or right location at least twice as often as the other two locations combined).

2. *Avoidance.* The S selects one of the locations less than one-half as frequently as the location chosen most frequently.

3. *Faulty prediction.* The S correctly identifies the object being sought but cannot verbalize the principle or predicts the movement or change of position incorrectly.

4. *Wrong position.* The S incorrectly chooses a position, other than the oblique, on Test 2 and persists with this selection.

5. *"Superstition."* The S believes that a given position "belongs" in a given location or that some position "should not belong" in a given location.

6. *Arbitrary hypothesis.* The S makes an unwarranted assumption about the nature of the solution and persists in this assumption over a number of trials.

7. *Cue-spotting.* The S picks out some real or imagined surface flaw on the box and follows the boxes with his eye to detect the flaw before making his selection. This procedure did not continue very long, since after five successive correct choices E asked S for the principle. The S would usually either admit the cue-spotting as his solution or say that he hadn't any idea. In either case E performed a quick sleight-of-hand in substituting a fresh set of boxes.¹⁸

8. *Random selection.* The S makes no attempt to locate the correct box but either closes his eyes and swings his hand over a box to touch it or wildly aims at a box or merely guesses on each trial without attempting to work out a principle.

9. *Movement pattern.* The S apparently realizes that the correct box does not remain in the same location on every trial. He, therefore, tries out several "hypotheses" as to the correct location. He assumes that the location of the correct object changes from trial to trial. Attention is not paid to the position of the object. A location-set may yet be operating but no single location is given preference over others.

The above nine categories are not mutually exclusive, since it is possible for a child to exhibit several types of response during the session. Nevertheless, most of

¹⁸ Cue-spotting was also defined as S's attempt to pick the right box by watching E's facial expression or the direction in which his pencil was pointing, etc., as S hovered over the boxes. One child stopped at each box, looked at E and moved to the next until he made a choice.

our Ss tended to be consistent in falling into only one or two response categories. The findings reveal that there are a few differences between Groups A and B in the manner of approach to the set problems that lead to failure. *There are few cases of perseveration of set in either group* (i.e., left-location would be evidence of such a carry-over from Test 1). Both groups show equivalent tendencies to interpret the instructions literally. We gauge this tendency from the existence of "middle-set" and "right-set" responses. Apparently Ss making such responses are responding to the mandate to "find another trick" by searching for a "location-trick" but in a *new* (other than left) location. Hence, we may say that some aspect of the location-set and right-set responses persisted. The response of "left avoidance" would also indicate a concrete, instruction-bound type of response. The child, assuming that he must find a "new" location in the next test, avoids the left-location because "left" was the correct solution of the first test. Hence, he divides his responses about evenly between middle and right. (All four of these categories—left, right, and middle sets and left-avoidance) are essentially *location sets*: S is not responding to the position of the objects in as systematic a fashion as he regards their locations with respect to one another. Hence, all four of these categories give evidence of perseveration from Test 1.

The "random selection" category provides the first significant qualitative difference between Groups A and B. Prejudiced children, more frequently than non-prejudiced children, tend to choose at random from trial to trial, rather than trying to seek some systematic relationships between their successful and unsuccessful choices. They guess the response. Some children do this by swinging their

arms over the boxes in picking an object—any object—they may fancy. Others try to devise a scheme of some kind (i.e., eenie, meenie, minie, mo, catch a tiger by the toe, etc., or 10-20-30-40, etc., to 100), in the hope that the final word or digit will fall on the correct object. Random selecting apparently increases in frequency from test to test. Nine Ss (3 in Group A and 6 in Group B) exhibited this response on Test 4, although a total of only five such responses are found in Groups A and B combined on the two previous tests.

Cue-spotting occurred as frequently in Group A as it did in Group B. In a sense, cue-spotting is about as random as is random-selecting. The difference between the two is the systematic fashion in which the S watches the boxes or E for some sign of the correct box during cue-spotting, as compared to the desultory "calling" in random-selection.

The category "faulty prediction" yields equivalent frequencies for each group. The S has the idea of position (in Test 2) and of movement (in Tests 3 and 4) and may even select the correct box for more than the required five consecutive trials but incorrectly verbalizes or predicts the position or type of movement necessary to achieve a solution. It is possible that some of these Ss actually have the solution but simply cannot express it adequately. They were scored as having failed the test, however, since it was decided to allow a successful response only when both the criteria of consecutive correct trials and prediction or verbalization were met.

Arbitrary hypotheses are offered in six cases by Group B and only one case by Group A. The six responses in Group B represent 13.5% of the total responses for Group B—the second greatest percentage of responses in that group. The

six arbitrary hypotheses offered in Group B are the work of five subjects. They occur on tests 3 and 4 indicating the increasing randomness of response with increasing failure in some subjects.

The category "wrong position" is exceedingly interesting. Only three subjects gave this response, all in Group A and all on Test 2. Essentially, this is a set-breaking response. The *S* assumes that he must now look for another principle but mistakenly selects either of the two positions that are not correct. This is probably a form of rigidity since *S* apparently "wants" the correct position to be the one he selects. Nevertheless, he does recognize that he is not seeking a particular location. His persistence with a position that is consistently incorrect is, however, just as maladaptive to the situation as any other form of error mentioned above.

The "superstitious" response appears with equal frequency in Groups A and B. The *S* persists in the belief that one or more positions "belong" in given locations. Therefore, he will not, for example, select the oblique box in the left-hand location, but will pick it only when it appears in the middle location. This type of response is probably a location-set but is coupled with position beliefs probably because they have a disturbing influence on *S* who is trying to concentrate on locations.

The final category is the movement pattern response. This is the most adequate type of response that characterizes the errors made by *Ss* in the course of failing to solve the problems. Unlike the location-set responses mentioned above, here the *S* attempts several "provisional tries" (to borrow another term)—all within the framework of finding the correct location by establishing the movement pattern for the correct box. The usual

response is that: "It moves to different places." The "it" in question is not the position of the objects (i.e., vertical or oblique boxes do not move) but simply the correct object.¹⁹ The difference in frequency between Groups A and B on this category is short of significance.

The above analysis concerned itself with the *responses* of subjects on our problem-solving tests. We now proceed to test our hypotheses concerning the operation of perseverative mental sets in our two groups of subjects. Since a subject may produce more than one response on each test, each subject who failed a test was placed into one of three categories: (a) location or movement set, (b) adequate methods, and (c) inadequate methods. For the most part, location sets were found operating on Tests 2 and 3, while a movement set was found on Test 4. We have already described a location set. A movement set resulted when an *S* attempted to use the same formula on Test 4 that had operated on Test 3 (i.e., left, middle, right, left, middle, right, etc.). An "adequate" method was described by the *S*'s realization of one of the essential qualities of the solution (i.e., the movement of the objects rather than their stationary character, typical of the set solution in Test 2). The "faulty prediction," "wrong position," and "movement pattern" responses were thus defined as adequate responses. "Inadequate" method was defined as a failure to deal with the essential problem of each test in an other-than-set fashion. Thus, the "random selection," "cue-spotting," "arbitrary hypotheses," and

¹⁹ The large number of random selection responses on Test 4 may in part be attributed to *S*'s failure to be aware of the movement of the objects in systematic fashion. Therefore, *S* gives up his attempts to work out a solution. To him, the movement is arbitrary and random.

"superstition" categories are considered as inadequate responses. In all, there are 72 cases of failure, 39 in Group A and 33 in Group B. *It has already been demonstrated that the pass/fail ratios of the two groups are significantly different.*

Do prejudiced children fail the critical problems more frequently—and fail because of the interference of perseverative sets?

From Table 18 we noted that 18 subjects in Group A passed Test 2 and that 20 failed. Of these 20 failures, 5 failed because of perseveration of the principle of Test 1. Hence, of the 38 unprejudiced subjects, 13.2% failed Test 2 due to a perseverative mental set. In Group B, 12 of the 15 subjects failed Test 2. Of these 12 failures, 4 or 26.7% were due to the perseveration of the principle of Test 1. These differences are not significant.

Turning to Test 3 we find that, in Group A, 32 subjects passed and 6 failed; and, of these latter, 2 fell into a perseverative set. In Group B, 7 subjects passed and 8 failed Test 3. Only 1 subject failed due to a set. Again, the group differences are not significant. On Test 4, 4 subjects, of the 13 failing in Group A, failed due to set. There were no set failures in Group B on Test 4.

Obviously, from these results we must conclude that pernicious mental sets were *not* the primary cause of failure on these tests. Even if they were, we have not been able to detect them. It remains for further research to determine whether this conclusion is reliable, especially in view of Rokeach's conflicting results. It should be re-emphasized that we are here dealing with *failures* on tests of problem solving. Great differences have been found between our two groups in their respective ability to *solve* these problems.

Slightly more than half of the 39 fail-

ures in Group A were problems whose solutions were not far from accuracy. Only 21% of the failure solutions are "inadequate." In Group B on the other hand the comparable percentages are 27% and 58%. These differences are reliable at the .01 level of significance.

These rather unexpected findings lead us to suspect that gross cognitive differences *do* distinguish prejudiced from unprejudiced children. Major evidence in support of this view comes from the fact that the general method of approach to the problems appears to be quite different.²⁰ Tentatively, we may state that:

1. Unprejudiced children appear to be more task-oriented to the problems, staying within the confines of the demands of the situation. This is indicated by the significantly greater number of "adequate method" failures, as well as by the high rate of solutions, as compared with the prejudiced group.

2. Prejudiced children tend to become discouraged and perplexed rather easily over the problems. Perhaps we are here dealing with the effects of frustration induced by failure. We feel that such motivational factors as low frustration tolerance and low threshold for feelings of defeat are aspects of what might be called a "prejudiced personality pattern," closely related to cognitive functioning. Such categories of response as "random selection" and "arbitrary hypothesis" are the cognitive counterparts of feelings of despair, intolerance for intellectual tasks, and a need to do *something* that approximates the demands of the problem.

3. From the point of view of insight or understanding of the problem and its solution, prejudiced children are vastly inferior to unprejudiced children

²⁰ As indicated below, intelligence appears to play a role in these differences, if an obscure one.

on this test. Not only do children in Group B fail more frequently than Group A children, but in failure they are significantly further from any acceptable form of solution after the standard units and time limit than are Group A children. Recalling that general intelligence for each of the groups is equivalent, we feel justified in assuming that the differences are more likely functions of "personality," attitudinal and motivational factors than they are of special intellectual factors.²¹ This is not meant to deny the importance of the organization of intelligence in individual children or to set forth a dualistic "mental-faculties" argument. We merely wish to point out the fact that the nature of our results requires a far broader interpretation than one solely encompassing the cognitive functions.

²¹ The argument may be raised that the incidence of set-induced failures on our test of problem solving may be attributed to a deficiency in intelligence. In this instance such an argument finds support. The mean IQ of those who passed all four tests is 118.0 ± 10.8 ; the mean IQ of those who failed two or three tests as a consequence of some form of inefficient mental set is 111.1 ± 10.8 . The difference between these two means is significant at the .05 level.

Breaking the data down into component subgroups, we find that no differences exist between the mean IQ's of those who pass all four tests and those who fail two or more tests in Group A (mean IQ of the latter group is 114.9 ± 7.4). Since only one subject passed all four tests in Group B, no similar comparison may be made. The major contribution to the depression of the mean IQ among those who failed is made by 12 subjects in Group B. Their mean IQ is 101.1 ± 10.7 , differing significantly from those in Group A who pass all tests, and approaching but not reaching significance in the mean IQ difference between those who fail in each group.

Hence, intelligence appears here to be associated with problem-solving ability: The failing subjects are generally less intelligent, while the more intelligent subjects find solutions. The meaning of these results is not altogether clear, since we do not know what function problem-solving ability plays in determining the final IQ.

Summing up, we set out to test the abilities of our two groups to solve certain conceptual problems. Our hypothesis centered on the point that the more prejudiced children would more likely fall into inappropriate mental sets and hence fail the problems more frequently than would the less prejudiced children.

We found that while children in Group B failed our critical tests more frequently than did children in Group A, the former did *not* fail due to the presence of a perseverative mental set any more frequently than did the latter. In examining the determinants of failure we found that children having anti-ethnic attitudes tended to employ methods highly inappropriate to the solution of the problems. Children possessing few anti-ethnic attitudes tended to come closer to a solution making "good" errors even when they failed to reach a correct solution.

It was speculated, with some evidence, that there are important cognitive differences between our two groups. Although perseverative set was not prominent as a factor, such items as low frustration tolerance, "anti-intellectualism," lack of insight, and a lack of task orientation were important factors determining our results.

Inasmuch as our results tend to conflict with those of Rokeach and as a consequence of the actual differences obtained between the performance of our two groups, additional research in the area of problem-solving behavior and ethnic attitudes seems warranted.

PATTERNS OF MENTAL FUNCTIONING— SUMMARY AND INTERPRETATION

In previous sections we have studied the thinking of ethnically prejudiced and unprejudiced children. In the present section we shall attempt to bring to

gether our findings and to determine what "typical" patterns of mental functioning seem to characterize the prejudiced and unprejudiced child. We shall also venture some tentative hypotheses concerning the role that such patterns play in the total personality organization of each type of child. Finally, we shall attempt to draw some general implications from the present research.

Patterns of Mental Functioning

The central purpose of the research reported in this paper was to determine whether certain special types or qualities of mental functioning distinguished children who were more and less ethnically prejudiced. Examining the results obtained from our five tests, certain clear tendencies emerge, which, by their direction and statistical significance allow us to depict typical patterns for each of our two groups of Ss. Hence, what follows must be regarded as broad approximations of the thought processes of typical prejudiced and unprejudiced children. Four "areas" of mental functioning will be discussed in turn for each group. These are ethnic attitudes, generalization (concept formation), deduction (drawing implications from given facts), and mental flexibility.

1. *Ethnic attitudes.* Sixty seven-year-old children of better than average intelligence were given five tests. On the basis of an Ethnic Attitude Test each child was categorized as "more" or "less" prejudiced. The Ethnic Attitude Test was composed of items designed to elicit statements agreeing or disagreeing with strongly prejudicial assertions attributed to "other persons." Forty-two unprejudiced and 18 prejudiced children were found to fit the criteria established to evaluate responses to the Ethnic Attitude Test.

Analysis of the manner in which the prejudiced child responded to various ethnic groups revealed a tendency to generalize, categorize, and dichotomize. Ethnic outgroups were regarded as universally without virtues of any sort, while ethnic ingroups were exaggeratedly praised and

glorified. The ethnically prejudiced child tended to see other groups and their members in stereotyped or clichéd roles and as violators of rules of conduct to which he meticulously adhered. He thought of both ingroups and outgroups as fitting two ends of an all-or-none moral dichotomy: good or bad, dirty or clean, kind or unkind, etc. He tended to overgeneralize his responses on the basis of a single instance: he will feel hostile to Negroes because he heard that one Negro was not honest.

By contrast, the unprejudiced child tended to think of ethnic groups in individualistic fashion. He rejected sweeping generalizations made about his own group as well as about other groups. He tended to deny unjustified glorification of the ingroup. He qualified categorical statements with provisional or conditional statements (e.g., "Some colored might be dirty, sometimes"). He tended to equalitarian sentiments: other groups are just as good, smart, etc., as his own. He may deny any differences between other ethnic groups in countering attacks against outgroups.

A high degree of outgroup acceptances was coupled with a rejection of ethnocentrism. Denial was made of statements which attributed superlative virtues to Americans. Equal status, equal ability, equal potentiality was the central theme of his attitude toward each ethnic group.

2. *Generalization (concept formation).* A child was confronted with a concept formation test consisting of eight odd-colored and odd-shaped paper objects. He was required to find the "trick" that would yield equal groups of the identical "kind" of object. The concept of size would solve the problem, since only two sizes were presented. The concepts of color and shape yielded unequal groups.

An analysis of the performance of the prejudiced child on this test revealed:

1. A high incidence of failure to form the appropriate concept.
2. A tendency to become "stimulus-bound": to be incapable of divorcing the impelling surface perceptual attributes of color and shape from the situation in order for the relational concept of size to be admitted.
3. A tendency toward concretization as opposed to abstraction in approach to the objects: a high incidence of "personification" of the objects as parts of a jigsaw or as segments of some larger object.
4. A tendency to jump to the conclusion without testing "hypotheses" concerning the ultimate solution.
5. A tendency to persevere an hypothesis in spite of previous vain attempts to employ it toward achieving a solution.

6. Incapacity for making use of aids from *E* toward the solution.

Performance of the unprejudiced child on this test was marked by:

1. High incidence of success in achieving the appropriate concept either spontaneously or with aids from *E*.
2. Capacity for appropriately adjusting his attempts toward solving the problem in terms of aids given by *E*.
3. A markedly high incidence of "adequate" or appropriate "hypotheses" toward the solution of the problem.
4. A high incidence of "personification" and perseverative responses that nevertheless culminated in the appropriate solution.
5. Marked capacity for ignoring the irrelevant surface attributes of the objections and for dealing with the objects on an "abstract-conceptual" plane.
6. A tendency to ruminate or "mull" over the possible solutions before offering them as "final."
7. A tendency to offer *alternate hypotheses* when those attempted prove fruitless; to suggest a variety of potential solutions.

3. *Deduction (drawing implications from given facts).* In general, prejudiced children tend to find little difficulty in solving simple, strictly logical, formalistic, linear, deductive problems. However, in attempting to solve deductive problems in which alternate solutions are possible or where the problem involves the relationship of a complex of facts, the prejudiced child has difficulty. Typically, he attempts to alter the nature of the problem from one of comparative ambiguity to one of clear formal logic. In so doing he tends to simplify the problem by furcating it. He then proceeds to offer a "solution" for each furcated segment. The problem is seen as a group of separate problems, each with an independent solution. He tends to reconstruct them by removing the ambiguity: only one reply is possible. Further, the prejudiced child feels certain that his solutions to such problems are the only ones possible. Even in failing to see the errors he commits, he dogmatically holds to the solutions offered. Because they are oversimplified, his solutions tend to be relatively concrete, that is, they are determined by one premise, isolated from the complex of premises making up the problem.

The unprejudiced child has more difficulty with ambiguous than with formal logic problems but has significantly less difficulty than does the prejudiced child. He tends to solve the ambiguous problems in terms of their complexity, to relate the various aspects of the problem so that the conclusion drawn is based upon the total group of attributes assigned to the premises.

He tends neither to simplify nor to furcate the problems, nor to convert the ambiguous problems into formal logic problems. He may offer equivocal replies or specifically point out that the problem may have different answers. He tends to be undogmatic in his final solutions. When challenged he will admit the potentiality of alternate solutions, if he has not already offered them spontaneously.

4. *Mental flexibility.* All subjects were offered a test consisting of four subparts. In each instance, the child was presented with three rectangular boxes. On Subtest 1, the child was to "locate" the correct box which was rotated in three positions although remaining in the same place relative to the remaining boxes. The latter were similarly rotated in place. Subtest 2 made a given position (oblique) "correct" while all boxes were shifted to different locations on each guessing trial. On subtest 3, the child was confronted with three boxes all standing in the vertical plane. He was to find the box that began at the left hand and was sequentially moved by step intervals (to middle and right and left and middle, etc.) on each trial. Subtest 4 reversed the order of movement, the correct box being located at the right on the first trial.

Fifty-three Ss passed subtest 1, the criterion for being included in subsequent analysis of the results. An important source of failure was the high incidence of maladaptive or "inadequate" methods applied to the critical problems. This latter cause of failure appeared to be in part a function of low frustration tolerance among the prejudiced group. Excessive random guessing and the use of arbitrary concepts characterized the "inadequate" attempts to solve the problems.

The unprejudiced child tends to offer hypotheses concerning the solution that are in the proper direction: they are adequate to the solution of such problems as are offered them although they fail to find the precise solution. These latter are "good" failures.

Bringing the types of mental functions characterizing prejudiced and unprejudiced children in our study into sharp relief, we find the following patterns:

Prejudiced Child

1. rigidity	<i>Unprejudiced Child</i>
2. overgeneralization	1. flexibility
3. categorizing and dichotomizing	2. realistic generalization
4. concretization	3. individualizing
5. simplification	4. abstraction
6. furcation	5. retention of complexity
7. dogmatism (omniscience)	6. retention of totality
8. intolerance of ambiguity	7. lack of dogmatism
	8. tolerance of ambiguity

A closer examination of the above patterns reveals that two major characteristics of mental functioning typify the prejudiced child. These are mental rigidity and intolerance of ambiguity. The less prejudiced child concedes his own weaknesses and seems more interested in what the task demands of him than in the necessity of reaching some solution or conclusion to a problem. The prejudiced child tends to "look too hard" in searching for a solution. Consequently, he becomes enmeshed in an attempt to win the approval of the examiner by finding any solution even to the extent of altering the problem and overstepping the conventions of logic.

However, tied to the prejudiced child's intolerance of ambiguity there appears in his cognitive functioning a *need for control* or mastery over the situation. In attempting to cope with a complex, uncertain, constantly changing environment, the prejudiced child tends to alter his world in keeping with a basic need to maintain stability, definiteness, and certainty. Hence, a need for control would seem to account for the positive, concretizing, dichotomizing, dogmatic, and simplifying approaches that typify his thought processes.

To what may we attribute such primary mechanisms of cognitive functioning as intolerance of ambiguity and a need for control? What role do these mechanisms play in the total personality organization of the prejudiced child? What are their origins? Below a suggested interpretation of the functional importance of these two central concepts is offered.

We have seen in previous sections that the prejudiced child tends toward a rigid cognitive structure. He tends to view his world in terms of dichotomies, categories, and unequivocalities. He is intolerant of ambiguity. He tends to think in concrete terms, "captured" by the stimulus field to such an extent that he is blind to existing field relationships. He tends to be maladaptive to new evidence and new circumstances requiring changes in behavior. He tends to overgeneralize and to dogmatically hold to his views in spite of the presence of contrary evidence. He tends to ignore discrepancies resulting from his cognitional distortions or to restructure them so as to produce a superficial degree of consistency. He attempts to be omniscient by avoiding the admission of a lack of knowledge.

Implicit in the analysis that follows is the assumption that cognitional functions are part-processes of the larger personality organization. Furthermore, these functions, it is implied, represent the fundamental motivational and emotional structures and needs of the individual in the cognitional sphere. Thus, Frenkel-Brunswik (14) refers to the cognitive and per-

ceptual factors that are part of "the more general factors in personality organization" (p. 461).

In order fully to comprehend our findings in the cognitive domain, it would be necessary to have insights into the nature of the child's adjustment within his family, his emotional needs and satisfaction, his fears and his pleasures. Such insights are provided by a study of the familial structure and family relationships in the homes of prejudiced and unprejudiced children carried out as part of the California Study. We shall attempt to relate our findings to those obtained through this latter investigation. Inasmuch as part of the basic findings of the California Study regarding early childhood experiences are founded upon inferences drawn directly from *Ss*' statements about their own lives, it would seem a legitimate procedure to assume (for the most part) the validity of these statements as indicative of the actual state of affairs. Frenkel-Brunswik emphasizes the fact that an *S*'s statements may reflect the adult's preferred image of himself as a child. Further evidence from her study of late childhood and adolescent prejudice, however, leads her to conclude that: "the descriptions which our subjects give of themselves [as children] show at least a certain degree of correspondence with the actual facts" (P. 435).

Typically, those high in ethnic prejudice came from families whose primary values were concerned with social status, standing in the community, being "normal," "conventional," "average." The family was hierarchically structured with the father as a stern and distant disciplinarian, and with family roles rigidly assigned: father as the provider, mother the homemaker; father the disciplinarian, mother the sacrificing and moralistic lady. Both parents were "moral-models": they established a pattern of morality for the family to follow and discipline was meted out primarily for violations of moralistic rules. Discipline was typically severe, ego-threatening, and overwhelming (as in threats of castration) and was imposed from without (as contrasted with an internalized super-ego in the subjects low in prejudice).

The home of the composite low-prejudiced person was characterized by policies of equality (as opposed to dominance and submission in the high-prejudice person), dependence for love or succorance and goals of child-training based upon the incorporation of principles of conduct rather than the imposition of arbitrary rules intended to "conventionalize" the child.

High-prejudiced persons tended to conform to the family-imposed standards while low-prejudiced persons were more critical of their parents in open opposition and showed a high degree of love-oriented identification.

Frenkel-Brunswik interprets the effects of these characteristic family patterns on the development of prejudice as follows:

"The lack of an internalized and individualized approach to the child, on the part of the parents, as well as a tendency to transmit mainly a set of conventional rules and customs, may be considered as interfering with the development of a clear-cut personal identity in the growing child. Instead, we find surface conformity without integration, expressing itself in a stereotyped approach devoid of genuine affect in almost all areas of life. . . . Even in the purely cognitive domain, ready-made clichés tend to take the place of spontaneous reactions" (p. 385).

By the time most children are seven years old they have already learned the game of social relationships in the context of the family unit. The more prejudiced seven-year-old has been forced to accept a set of comparatively rigid "laws" for getting along with his parents. On the whole, he does not comprehend the "reasons" that these laws exist but he does know that to violate them means punishment, often of a severe and ego-threatening nature. Hence, the more prejudiced child tends to submit to the rules and to "play the game" according to them. Failing to comprehend the ultimate purposes of the stringent restrictions placed upon him, he assumes that some *evil external* force makes some children "bad" and others "good." As Frenkel-Brunswik puts the matter, when the child's behavior violates the conventions of behavior ordained by the parent these conventions are rendered "ego-alien": they are not really part of his "normal" or "integrated" self but may be attributed to outside forces such as bad luck, or simply "forgotten."

Ego-alienation of other aspects of the child's personality structure becomes the rule: the child does not develop identifications within the family that are based upon affection. Rather, his relationships with parents and siblings may more properly be described as "associations." It is probable that the key to the child's ego-alienations is the unassimilable threat of punishment posed to the ego based upon what to the child is probably an incomprehensible and unpredictable "Damocles sword." Yet, he is still dependent upon his parents. Approval is given for adherence to the parental proscriptions. As a consequence of being both dependent upon and fearful of his parents, the prejudiced child tends to repress the hostility he feels against them. Such feelings would be wholly unacceptable in a situation demanding conformity. Ambivalence toward the parents becomes an anathema to the prejudiced child.

As in other cases of severe repression of un-

acceptable ideas or behavior, the child overcompensates with positive feelings for his parents: they are not only good parents, they are ideal. The California Study points up the exaggerated idealization and unrealistic evaluation of their parents by the more prejudiced group. Similarly, through a reaction formation, those violating the code of behavior dictated by the parents are seen as violators of societal codes: there is a violent rejection of nonconforming, flexible, or unconventional behavior. The seven-year-old prejudiced child rejects those who do not fit the patterns laid down as acceptable by his parents. In his terms the "value-violators" are those who are in some way different from himself and his ego-ideal.²² Typically, his is in an all-or-none response: the outgroup is rejected *en masse* and the ingroup is unquestionably accepted as a whole.

The cognitional correlate of the rejection of ambivalence, according to Frenkel-Brunswik, is intolerance of ambiguity. Associated closely with intolerance of ambiguity is a high degree of rigidity featured mainly by dogmatism, fixed set, and close adherence to convention.

We may now turn to the main task of the present section: attempting to define the functions that appear to be served by intolerance of ambiguity and a need for control in the ethnically prejudiced seven-year-old.

As noted above, the cognitive counterpart of emotional ambivalence is intolerance for ambiguity. The child avoids those aspects of his environment in ambiguous situations that pose a threat to him. Ambiguity threatens to bring to the surface of consciousness the basic anxiety due to the presence of ambivalence in the prejudiced child's personality organization. We have quoted Frenkel-Brunswik's view that ambivalence leads to dichotomization and displaced projected aggression.

We suggest that the prejudiced child's fear of ambiguity leads to a *need for control*: that is, he strives to impose structure upon ambiguity, decisiveness upon uncertainty. He attempts to control his environment so that the uncertain, indecisive, and unknown are eliminated. Particularly, he attempts to remove from experience equivocal aspects of his environment. Thus, he removes the enigma of diversity within ethnic outgroups. There cannot be *some* dirty Negroes, since the existence of an unknown group of potentially "different" Negroes casts doubt on the status of all Negroes. By asserting the universal rejection of outgroup members he can be sure that each Negro is "pegged." The need for controlling the

²² Frenkel-Brunswik (I, p. 430) has pointed out that the adult bigot's ego-ideal and image of the self are identical (i.e., he is everything he would want himself to be).

environment (as well as for controlling himself) helps the individual feel secure that his world is stable, permanent, predictable, rigid. The seven-year-old's rejections appear to be more "universal" than those of the adult bigot.²³ Hence, in the sphere of group attitudes, the child who is high in prejudice categorizes and dichotomizes his responses. The child achieves status through association in the identical fashion that status is achieved in the family group—by adhering to the prescribed code of standard behavior.

In the area of concept formation, the prejudiced child tends to become stimulus-bound, concrete in approach and random in seeking possible clues to the concept. He tends not to be capable of generalizing in a manner appropriate to the reality demands of the situation. Some of the more prejudiced Ss jump to conclusions while others offer unrelated "guesses" in the hope of hitting the right formula. The greater frequency of guesses and from other evidences (such as the almost complete lack of Don't Know responses on the DRT), suggests that the prejudiced child has a *need for pseudo-omniscience*, closely related to the need for control. If all is known, there is no fear of the *unknown* to be encountered and, similarly, complete knowledge obliterates any ambiguities that may in fact exist.

When inescapable cognitive ambiguity is encountered, the prejudiced child tends to render it harmless by removing the factors in the situation that are equivocal. In the Deductive Reasoning Test, he tended to avoid dealing with the relatively complex, seemingly contradictory ambiguous problems by segmenting them into simple, unambiguous "formal logic" problems, each with an autonomous solution. His responses, as a consequence, were more concrete than those of the unprejudiced child. Concretization and furcation served to simplify complex phenomena for the child.²⁴ These phenomena are converted into understandable, manageable, discrete events.

In attempting to solve the conceptual prob-

²³ The latter makes allowances for experience to modify his extreme views by asserting the existence of "exceptions" in the rejected ethnic groups.

²⁴ In similar fashion these mechanisms are employed by the adult bigot in accounting for "diverse" attributes of minority group members. Thus, for example, the prejudiced adult will speak of "the Negro" or "the Jew" in their generic senses and will bifurcate his views on Jews thus: "Jews are clannish, they always stick together" with "Jews are always trying to worm their way into non-Jewish groups."

lems of the problem-box test some of the prejudiced children tended to employ a "formula" to solve the problems. They developed set-superstitions and followed instructions in a concrete manner. The situation was controlled on the first critical problem by advancing a variety of inappropriate suggestions toward the solution. By the time the third critical problem was presented, the prejudiced child tended to become disturbed and sought in various ways to end the session. Failure resulted, in a large proportion of cases, not from the perseverative set that had contributed to failure on the first critical problem, but from the effects of low frustration-tolerance. The situation was no longer manageable but threatened to arouse feelings of anxiety. Hence, the child substituted "inadequate," random hypotheses, surface cues, or signs from *E* in an attempt to achieve an "accidental" solution.

It is because ambiguity, uncertainty, or indefiniteness threatens to arouse feelings of anxiety and hostility that lie below the surface of consciousness, that the child's thought processes become rigid. The rejection of hostility against the parents channelizes the affect associated with this hostility into external areas of life. To ensure that the feelings of hostility remain unavailable to consciousness, *all* areas of life in which ambivalences (or ambiguities) are manifested are rejected, converted, simplified, and hence controlled. Control over ambiguity results in control of unacceptable fear-arousing ambivalences.

Intolerance of ambiguity may be seen as a self-protective device whose function is to control ego-threatening unconscious feelings of hostility.

The child controls and manipulates his familial relationship successfully but outwardly conforming and submitting to the dominant parents. He generalizes his own need to conform and condemns others for failing to submit to the same pattern of rules of conduct to which he adheres. Those who fail to conform are universally rejected. Where the parents tend to emphasize the violations, the child will be quick to agree (i.e., "Don't play with colored children, they are bad" is generalized to "colored means bad," hence to the universal condemnation of Negroes).²⁵ Similar dichotomous moralisms feature the prejudiced child's views of people, objects, and situations. He improperly generalizes, rejects unknown or equivocal stimuli (as well as being disturbed by ambiguous life situations), and demands a clear, unhampered, stereotypical,

²⁵ One parent reported that her child avows a hatred for "colored people." Upon interviewing the child *E* learned that the child's mother had warned him against "colored" children. He asserted to *E*, "I don't like colored people. I just like people who are black and white."

clichéd view of himself, his parents, and his world.

Obviously, these speculative interpretations require empirical testing. Among other possible fruitful research areas in this field would be studies relating parental methods in child-rearing to the development of social attitudes and to processes of thought. The results of the

present study seem to indicate that consistent patterns of coping with both the social and the natural world have their origins in childhood experiences. Investigations of the factors in the child's social experience tending to establish these patterns would be of great value to students of learning, personality, and intergroup relations.

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APPENDIX A

ETHNIC ATTITUDE TEST

1. There are city people and there are people who live in the country on farms. Some city people say that the farmers are pretty dumb and they laugh at farmers. What do you think about that? How do you feel about farmers?

2. Some children learn slowly and some children learn fast. The fast children say that the slow ones are stupid or dumb. They don't like to make friends with slow children. What about children who learn slowly?

3. Some people think that Mexicans are not very nice. They say that Mexicans are dirty; that they are dumb and that they are not as good as we are. What do you think of that? How do you feel about Mexicans?

4. Some people are Jewish and some people are Catholics. Some Jewish people say that the Catholic people are not very nice. They say that Jewish is a better religion than Catholic. They don't like to make friends with Catholic people. What about that? How do you feel about Catholic people?

5. Some people are poor and some people are rich. Some people say that poor people would not be poor if they weren't so lazy and dumb. What do you think of that? What about poor people? Some people say that rich people made their

money by not being honest, that they cheated other people and became rich. What about that? How did rich people get their money?

6. There are colored people and there are white people. Some white people say that colored people are bad, that they steal and they are dirty and lazy and smell bad. What about colored people? How do you feel about colored people?

7. Some people say that Jewish people are not very nice. They say that Jewish people are too rich and that they are not like other people. They say that Jewish people are cheaters and they do not want them for friends. What about Jewish people? How do you feel about Jewish people?

8. Some people say that Americans are better than any other people in the whole world. They say that American people do things better and make nicer things than other people. How about Americans and the other people? Are Americans better than other people?

9. Some people say that white people are not nice to have as friends. They say that white people are not as nice as colored people. They say that white people are mean and hurt people and fight with them. What about white people?



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